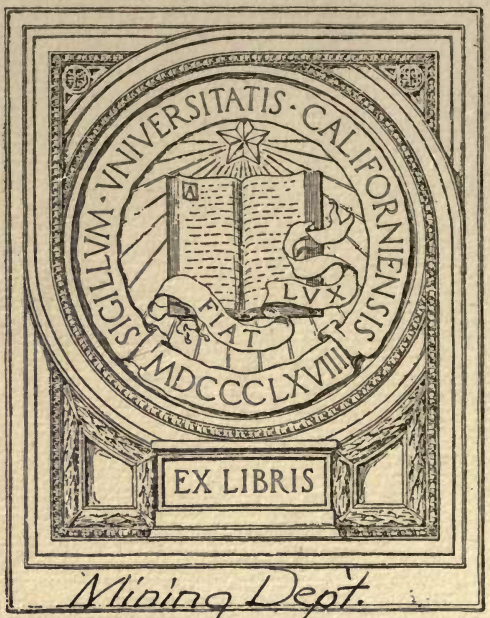

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INTERNATIONAL MINING LAW

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PREFACE

Practically all the raw material in this volume was collected primarily for the purpose of enabling the author to form an intelligent opinion as to whether the American Federal Mining Law was in need of revision, and if so, in what respects. To accomplish this two kinds of information on the subject appeared to be necessary. First, a knowledge of the mining laws of other countries, for the purpose of being able to compare them with our own and to note the points of difference; and second, the statistics of production in the principal metal-mining regions of the world, so as to be in a position to judge of the comparative worth of each law by the results obtained under it. As the investigation advanced it was found desirable as well as interesting to take note of the salient features of the history of the industry in each principal field. This naturally led to an inquiry into ancient and repealed mining legislation and customs, the better to understand those now in force; which, in its turn, called for a study of the beginnings, rise and growth of the occupation of mining. And now, in putting together the results obtained, the steps taken are naturally reversed in the act of publication. It is hoped that the arrangement adopted will prove a suitable one from the point of view of the reader.

Mining law is a broad subject. In the digests of laws given, with a view to confining the investigation within reasonable limits, the attempt has been made to give only those parts of each which referred to metal mining, omitting wherever possible those having to do with coal, iron, and the non-metallic substances. Naturally the statistical tables have been prepared on the same plan.

A considerable number of the laws abstracted were found to be of only moderate assistance to the inquiry; either because of their comparative antiquity or crudity, or for the reason that

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they had been framed to apply to special or unusual conditions, or consisted mainly of rules and regulations governing the activities of subject or half civilized people. Yet even in these there were generally found features of interest, and consequently all have been given in Chapter 12, along with others—like that of Japan—that are quite up to date, and well worth the consideration of the student.

THEO. F. VAN WAGENEN.

DENVER, COLORADO.
May, 1918.

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INTERNATIONAL MINING LAW

CHAPTER I

History of Mining and of Mining Law Previous to the Discovery of America

Mining law, as might be expected, has been a development from the line of activity with which it deals. It could not exist until the industry itself came into being. Hence, a knowledge of the origins of mining as a business is necessary for a clear comprehension of the fundamental peculiarities of mining law.

There was a time (and not so long ago) when all metalliferous deposits were regarded as the personal property of the feudal lord of the region in which they were found, no matter what rights he may have granted for the use of the surface. This assumed sovereignty persists in many countries to-day in regard to gold and silver, because when coined they become money, and the manufacture of money has always been considered a State monopoly; and in some countries it persists in regard to all the other desirable metals and minerals. When the will of the local sovereign was the only law in existence, there was really no law, as we understand the term to-day, for there was no concensus of public opinion behind his decrees. When sovereign rights began to suffer curtailment in favor of those of the community and individual, these irresponsible edicts were gradually superseded by laws which gave greater recognition to the rights of discoverers and producers of desirable mineral substances.

Again, it is only a very few years—as historical time goes—since the list of the known metals included more than seven, viz., gold, silver, mercury, copper, tin, lead and iron. Not until

the year 1700 was zinc clearly recognized as an element, and although antimony and arsenic were known to be individual substances before that date, the metals themselves did not become articles of commerce until many years after. Fifty years ago neither aluminum, nickel, platinum nor bismuth could be purchased in the market, nor any of the ferro metals (manganese, chromium, molybdenum, tungsten, vanadium and uranium). In fact, many of this last list have been produced commercially only during recent years.

Coal mining as an industry is really of very modern origin. The production of coal in limited quantities, and for domestic use in the immediate vicinity of the mine, began in 1750, but the industry was not on its feet until 1820. Coke, although made in England as early as 1619, did not become a successful competitor of charcoal in the manufacture of iron until 1740.

So we shall find, as we dig into the subject, that mining law has been from the first merely a modification of the common law relating to real property; and to understand properly the causes that have led to its differentiation into a subject by itself, it is necessary to become acquainted with the beginnings of mining.

Gold, which was probably the first recognized of the metals, has been an object of search for at least 8000 years. Yet mining of gold as a commercial operation cannot be said to have begun before its almost simultaneous discovery in California and Australia less than seventy years ago; for, previous to that momentous occurrence, the entire gold supply of the world came from placer mines, or from quartz veins yielding visible metal, from which it was separated by the crudest processes of hand crushing and washing.

Reducing iron from meteorites was undoubtedly one of man's earliest achievements, and in certain regions favored with very pure and high grade ores the metal has been in use since the dawn of history. But its production in commercial quantities is a matter of very recent date, as we shall see.

Perhaps the earliest organized mining of which there is any record was at Laurium in Greece. Here was discovered, at least

as far back as 1000 B.C., very notable deposits of silver-lead-zinc ore. The location is on the coast, and it is believed that the Phœnicians held and worked the mines for some time. Evidences of Mycenæan civilization have been found in their immediate vicinity. There is proof that the mines were actively worked by the Greeks between 600 B.C. and 400 B.C., and that so much silver was produced that the Athenian state, in whose territory they were, became very wealthy. They were owned by the Government, which leased them to its citizens on royalty, and the actual mining operations were carried on by slave labor.

The deposits of the Iberian peninsula, which yielded to the ancients vast quantities of silver, were being worked by slaves under Carthaginian taskmasters as early as 250 B.C., and when Rome succeeded to the sovereignty of the country the system was continued.

It is probable, though perhaps it cannot yet be proven, that the most ancient metal-mining industry of a more or less organized character was that which grew up slowly through the ages at the East Indian tin deposits. To understand its importance we must recall the fact that copper is the only metal existing in a native or pure condition in any quantity in the crust of the earth, and accordingly the archæologists generally find at the beginnings of all civilizations a period when implements, ornaments and weapons of the metal were used. Succeeding it, and before an extensive knowledge of the metallurgy of iron was current, is generally found an age of bronze, an alloy composed of copper and tin. Tin is never found native, but its principal ore—cassiterite—is easily reduced, at a comparatively low temperature, to the metallic state. As cassiterite is black or dark brown, and quite heavy, it no doubt attracted the attention of men at a very early age, and when, by some accident, it was found to yield in abundance a white metal, which probably was at first mistaken for silver, their astonishment must have been great. However it came about, at some place and at some time this new white, soft metal came into contact with copper tools or weapons, and the very useful alloy, bronze, was discovered, which would take and

keep an edge under circumstances where copper alone failed to do so.

Unlike gold and silver, tin occurs in payable quantities in only a few places in the earth's crust, and nowhere so abundantly as in certain parts of the Malayan peninsula and of the islands adjacent to it. It exists there in the form of dark and heavy grains in alluvial gravel deposits, from which it is easily separated by the simplest methods of hydraulic mining. The area of these Asiatic placer regions is very extensive, and the proofs of their exploitation in very remote ages are abundant There is also no doubt that, in the centuries during which the Phœnicians were the dominant people of antiquity, a very considerable commerce was carried on between Asia and Europe, one of the principal items of which was tin. For this useful metal Europe gave silver in exchange, which was scarce in Asia, but abundant around the Mediterranean basin.

The central European mining region, of the Sudetic Alps, that broad series of parallel ranges in Bohemia and Moravia connecting the Carpathians with the Swiss mountains, attracted the attention of the Romans when their sway had extended itself into that region, during the first century of the present era, but their tenancy there was too brief and uncertain to allow them to organize an industry except of the most primitive kind on the basis of the great mineral wealth that the country contained. But when the Empire fell to pieces these regions gradually passed into the possession of Teutonic and Teuto-Slavic peoples, under whose control mining slowly became a business of some standing. In the 8th century there appears to have been considerable activity there, based mainly upon the production of silver, lead and copper. The great salt mines at Wielitzka were actively producing in 1040. The Freiburg silver mines were discovered (or probably re-discovered) sometime between 1100 and 1200, the Kuttenberg district about 1225, the Przibram lodes in 1300, the Idria quicksilver mines in 1497, the Clausthal argentiferous lead veins between 1500 and 1600, and early in the 16th century there was a mint at Joachimsthal at which the Joachims-

thaler—the ancestor of the modern dollar—was coined. At Iglau in Bohemia, where it is thought that the rich silver veins of the vicinity were worked by the Celts perhaps as early as A.D. 500, there is extant, in the Town Hall, a code of mining laws dating as far back as 1249. These constitute, so far as I have been able to ascertain, the first codification of laws relating to the mining industry. That they were as yet merely a statement of the rules under which the local sovereign permitted the peasantry under his control to explore for and to extract ore from landed property considered as belonging solely to him, does not detract from their interest; for throughout the Russia of to-day similar laws until recently prevailed, all the unoccupied land of the Empire, besides vast areas of the occupied land, being regarded as the personal property of the Czar. It was these central European mines that gave to Germany her acknowledged primacy in mining knowledge and science in the civilized world, which she retained until the occupation became commercialized in the United States during the eventful years between 1860 and 1880.

It was not until 1623 that the Norwegian silver mines at Kongsburg were discovered. About a century later gold mining as an industry began in the Urals.

Copper, as a metal, never seems to have created an excitement among the ancients, or even during mediæval times. This was probably due to the fact that it was found abundantly enough in the native condition during the copper and bronze ages of each people at many places—Sinai, Cyprus, Persia, central and northern Africa, Spain, etc.—so that it was not necessary to obtain it from its ores. In due time, however, simple methods of its reduction from its carbonates, oxides and even sulphides were discovered; but by that time the metallurgy of iron had become so well developed, and the latter metal proved so superior for the manufacture of weapons and tools, that the sole demand for the red metal was for ornamentation, for which a small annual production was ample.

Iron first became known as a metal in the form of meteorites, and there are astronomers who believe that in primitive human

ages the arrival of these visitants from space was more frequent than at present, or perhaps more often noticed. However, the reduction of the metal from its most common ore—hematite—was a simple matter, as soon as the use of fire and the advantages of charcoal as a fuel became generally known, and the widespread occurrence of this ore was not favorable to the production of any particular excitement. With the ancients iron and steel production was never an industry, although it became the occupation of numerous individuals in all parts of the human family, who, either by accident or through intelligent study, became more or less proficient in the production of high-grade steel. In the Middle Ages Damascus and Toledo blades had a great vogue, as also certain brands of weapons and armor made in India. This we now know was due as much to the purity and freedom from phosphorus and sulphur of the ores from which these articles were made, as to the skill of the makers thereof. Also the fine heating qualities of the charcoal used had much to do with the favorable outcome, for it is now well known that certain kinds of wood, produced mainly in tropical or semi-tropical regions, will yield a charcoal of far higher metallurgical value than others. Fifty years ago Swedish charcoal iron and Russian planished iron were in great demand for special uses on account of their purity, resulting from the clean ore from which they were produced, and the fine fuel used. But both have now been supplanted by modern steels of many kinds.

Articles of iron, believed to have been fashioned as early as 4000 B.C., have been found in the Pyramids. The metal was extensively in use among the Assyrians from 2000 B.C. to 600 B.C., and among the Greeks from 800 B.C. When the Romans reached Britain in B.C. 55, they found it in common use among the aborigines of the country. During the Middle Ages (5th to 15th century) knowledge of and demand for the metal steadily increased, and by 1350 in Germany the science of heat production had reached the point where large iron castings became possible. This knowledge and proficiency spread into France and England, and when in 1740 the manufacture of good coke became possible

the industry was firmly established, especially in those places where there existed a superior quality of coking coal. It was this circumstance that carried the primacy in iron and steel manufacture to England, whose coke is still the best produced in Europe. In 1855 the industry was further advanced in England by the invention of the Bessemer converter; and this really marks the beginning of the modern art, which therefore is not much more than half a century old.

When bronze was supplanted by iron and steel for the manufacture of weapons and tools, tin mining languished wherever it had previously flourished. For there were few other uses for the metal than the production of bells, coins and statuary, which called for small quantities only. Hence the Chinese and Malay deposits were practically forgotten by the western nations, and when the metal was found in payable quantities in Spain, Austria, and Cornwall it caused little interest in the mining world. However, in 1789 Dutch experimenters of the city of Haarlem appear to have taken some first steps in the art of electroplating, about which there was much interest on the continent on account of the discoveries of Volta and Galvani in the same line. But it was not until after Faraday, in 1834, worked out the laws of electrolysis that tin plate manufacture became possible commercially, and that mining in Cornwall on the tin-bearing lodes that were so plentiful there, and that had been known ever since their discovery by the Phœnicians, attained its greatest days of prosperity, and gave to the Cornish miner the reputation he deservedly held for so long as a proficient in underground work.

In 1837 the first English patent describing a method of coating iron with zinc was granted, which laid the foundation of an industry that has since become even more important, for by that time the metallurgy of zinc had been fairly well worked out in Belgium and Germany, as well as in France.

The metallic character and properties of lead were well known to the Romans, as witness the crude piping made of the metal and put to use in many of the houses that have been uncovered in the ruins of Pompeii. But there is no evidence of any great produc-

tion of the metal from even the Laurium mines in Greece, whose ores appear to have been worked mainly for their silver contents, in the recovery of which the bulk of the lead was volatilized and lost. The manufacture of paint, shot and piping are, and always have been, the principal uses to which this metal is put. But these are modern arts, and lead was in small demand previous to the 15th century.

Mercury also was a metal which the ancients used but little, although it was known certainly as early as 300 B.C. being supposed at first to be a liquid form of silver, from whence its other name. The Spanish mines at Almaden were worked in a desultory way by the Romans, but mainly for the raw ore—cinnabar—from which the highly valued pigment vermilion was made. The Austrian mercury mines at Idria were not discovered until 1497, by which time someone had invented a process of making mirrors by coating one side of a sheet of glass with an amalgam of mercury and tin, in consequence of which a fair demand arose for the metal. This art is said to have had its origin in Venice, about 1300, from which it spread through Germany and France, reaching England in 1673. Previous to this invention mirrors were made of polished metal, either silver or bronze. In 1836 Liebig made the first attempt to substitute a silver for a tin amalgam, and the art was finally perfected in 1855 by Pettijean in France, where it has since attained its highest state of perfection.

CHAPTER II

History of Mining and of Mining Law Since the Discovery of America

The general review of the subject in Chapter I shows that mining is really a very modern industry, and that mining law must of necessity be of recent origin. In fact, we may dismiss at once all expectations of discovering any more than its beginnings in Europe, or any other part of the old world; for, long before it was anything more than a haphazard occupation of individuals, the feudal system and its theories of land tenure had tied up all the land in the older settled parts of the globe, and made operations of any kind thereon dependent wholly upon the will of the local sovereigns, who promulgated such rules and regulations as they saw fit. These naturally were no more what would now be called law than were any of the other customs and regulations that have always accompanied the practice of human vassalage.

But upon the discovery of the new world, and the exploration of Mexico, Central, and South America, following the conquest and occupation by Spain and Portugal, a new era began. The stream of precious metal that came across the Atlantic, at first from the plunder of Aztec and Peruvian civilization, and later from placer deposits, attracted immediate attention, and drew a horde of adventurous spirits across the ocean, each with some kind of a recommendation from his European sovereign to the Viceroy of his nation in New Spain or New Portugal. At first these newcomers were easily taken care of. So long as there were desirable tracts of land to give away, grants were freely and even lavishly made. These gave to the grantees practically sovereign rights within their limits, including the native inhabitants as well, which held as long as agreed royalties were promptly remitted to

the Government. But a time soon came, even in the opening up of such a vast new area, when the few outcroppings of mineral known to the aborigines had been given away, and prospecting became a necessity. Up to this point the mining customs and regulations of the old world had simply been transplanted into the new, and consisted practically of such laws as were necessary, with the aid of the church, to keep the natives and the low-class, half-breed populations that had arisen in such a condition of poverty and dependence as would enable the land owners to command their services at practically no cost above that of food, shelter and clothing. The white man from Europe never became a prospector or miner. Such work was beneath his dignity. But he could induce or compel his subjects to explore, and so through offers of reward and threats of punishment many new and rich mineral areas were discovered. While this kind of exploration was in progress, difficulties frequently arose on account of the competing activity of the followers and subjects of the numerous Court favorites who had secured or had been promised grants, which in due time made necessary the promulgation of laws ostensibly intended for the encouragement of the mining industry, but really having for their object the prevention of such competition. But again they were no more in spirit than the rules and regulations that had prevailed in Europe for centuries, modified only to such an extent as was made necessary by reason of the different character of the subject population and the freer environment of a newly opened land. The old world peasant, after centuries of oppression and deprivation, had lost hope, had become servile, and had learned to make the best of it. His brother in the new world accepted the yoke only as a last resort, and after every avenue of resistance or escape had been tried in vain. As a result of this bitter contest there came a time when for each of the colonies the mining industry began to decline, and ultimately ceased to be of importance. As the old mines became exhausted, or, reaching water level, could not be worked profitably any longer, there was nothing in the way of new discoveries to take their place. In 1571 the Inquisition was introduced from

Spain, in the hope that its terrors would be of some service in spurring the natives to renewed energy in discovery, or at least stem the tide of rebellion that was slowly but surely increasing among them. This diabolical institution did assist for a while in enabling Spain and Portugal to retain control of their American colonies, but at the same time, as elsewhere, it brought enterprise to an end, and stopped intellectual progress. For a couple of centuries the whole of Latin America lay practically dormant, its marvelous mineral resources neglected, its white populations scarcely increasing, and, in fact, largely undergoing absorption into the mass of the aborigines, only those of its cities on or close to the coasts maintaining their standing and trade, and its interior being practically abandoned to the native and the mestizo.

Early in the 19th century this part of the world began to experience a revival. Revolution and banditry, already common enough, became the normal condition of affairs, but now with a new motive behind them. By 1825 the Spanish yoke had been thrown off everywhere, and in its place fifteen independent republics had arisen, Brazil becoming an independent empire and remaining so until 1891 when it too joined the roll of the Latin American democracies.

During the first half of the 19th century, in spite of the great political changes that had taken place in Latin America, little if any alterations were made in its laws affecting mining. The political leaders were too intently occupied with the task of keeping themselves in power or in driving out those who were in to pay much attention to anything else, and so the industry languished. But in the last half a revival occurred, particularly in two places. One of these was Chile, whose remarkable resources in saltpeter and copper attracted the attention of European capital; and the other Mexico, whose proximity to those parts of the United States where intense mining activity existed led gradually to the coming of American capital during the last quarter of the century. Responding to these external impulses some of the Latin republics took steps towards modernizing their mining laws, but in doing so

retained in essentials the fundamental principle upon which, in the past, the conduct of the industry had rested. This was the theory that mining rights should be granted mainly in the form of concessions, in the details of which the people as a whole need not be consulted, everything being left for settlement by the junta that, for the time being, held control of the government. As such a system is always favorable to capital, because it can be easily dealt with, the foreign influences not only favored it, but took much part quietly and unobtrusively in arranging its details. The mining codes that resulted represented no advance in their conception of fundamental human rights, and consequently their effect has been almost negligible in producing any modernization in the relations of the two great classes of the people. Under them, however, considerable material advance in the industry has taken place, particularly in Mexico, Chile, Peru and Bolivia, where also other factors have contributed to the result. Because of the still vast areas of unexplored regions in these countries, it may yet be hoped that the progress being made in other parts of the world in the way of a better understanding in such matters will in due time result in provisions for the disposal of what is left of the public domain of value for its mineral contents, more in accord with the spirit of the age. The bitter struggle that has recently occurred in Mexico has, at its roots, the determination on the one side to settle these land questions in modern ways, and on the other to retain the old systems and principles inherited from Europe.

So, in summarizing this part of the subject, while we may consider the systems of mining law in vogue in Latin America in the light of most interesting links connecting European customs and practice with those of the new world, we cannot reasonably look for much in them worthy of being incorporated into our own codes. The history of their origin and growth forbids this. They are laws made for subject populations, and for governments carried on professedly for the exclusive benefit of the privileged classes.

With the nearly simultaneous discovery of gold in California

and in Australia in the years between 1847 and 1852, primacy in the business of metal mining passed into the hands of the Anglo-Saxon peoples, where it now rests. Before considering in detail the various codes of mining law that have arisen since then among the several branches of the family it will be advisable to recount briefly the historical situation a little previous to and at the time of the discovery Without this it will be difficult to understand why legal conceptions on the same subject so different from those reached in Latin America have resulted, and also why, among themselves, so much variety in detail of fundamental principles exists.

In the first place, in both countries (California and Australia) the native population was so insignificant numerically that it was easily pushed aside. What few conflicts did occur caused no halt or delay in the rush of the incoming whites, and it left no serious trail of brutality or cruelty in its wake. Nor was there an ancient civilization to plunder. The American Indian of the West and the Australian blackfellow were both living in the Stone age of human culture when the wh te man poured into their country. Metals were unknown to them and possessed no significance. The stranger was welcome to all he could find so long as he did not interfere with the natives' hunting rights and social customs.

Again, neither of these aboriginal people could be induced to go to work for the newcomers. They preferred their wild life, and exhibited no inclination to adopt the white man's ways. The result was that the immigrants had to go to work themselves. For this in both cases they were well prepared, as the great bulk of the emigration to both California and Australia consisted, at first, of sturdy individuals of the farming and artizan classes, as a rule fairly well educated in fundamentals, and possessed of that independence of spirit that marks the true pioneer. But in this respect the Californian argonaut had somewhat the advantage, coming as he did from a part of the world where self government had been in effect for nearly a century, while as yet in all the lands that contributed population to the Australian goldfields

the peasantry had had no experience in such matters, and was quite accustomed to be guided by the views of the privileged classes. As we shall see, these circumstances produced some remarkable divergence in results.

Lastly, neither of the new communities had a mining code to guide its activity, nor any inherited traditions on the subject. In both cases the slate was clean, and it became their task to write their own laws as best they could. What resulted was inevitable and most interesting. The Americans at once organized, elected officials, constructed a code, and then dropped politics and went to work exploring the country. The laws so enacted were few in number, simple in principle, and embodied some doctrines that seemed to be entirely warranted by the conditions existing and the unusual environment. As might have been expected they were rather crude and unfinished in detail. While they showed remarkable notions of justice and common sense at their foundation, their superstructure was sketchy and pinned together without much regard for the science of economic geology or the theories of law. They paid liberally for this new departure in jurisprudence later on, but the results have proved to be worth the price.

The Australian discoveries occurred a few years later, and quite a sprinkling of American pioneers were in the first stampedes. As in California the miners quickly got together for organization purposes. Those of European origin, having had little or no experience in lawmaking, took counsel with the Americans present, and having considered the California code, appreciated its fundamental justice as well as its broad liberality. Knowing also that it was producing tremendously satisfactory results, they decided to adopt its doctrines with a few slight and unimportant modifications necessitated by the different environment. But here the matter did not rest, for there was an established government in Australia at the time, as against none at all in California. Consequently when mining litigation began in the new communities in Victoria and New South Wales—just as it did in America—and became vexatiously active, the conserva-

tive tendencies that are so strong in all British lands began to agitate for the abolition of the Californian doctrines, and the substitution of theories of land tenure more in consonance with European customs and practice. This succeeded, and in 1866 the laws first established by the miners were repealed, and replaced by the system now in existence.

On the other hand, in the western mining states of America no serious efforts were made to change the laws for nearly fifty years, and up to date no alterations in fundamental principles have occurred.

When mining began in Canada (in British Columbia), a similar series of events took place. The mining law enacted there was a copy of the American statute in all essentials. But in 1897 it was repealed, and for practically the same reasons that caused the abandonment of the doctrines at its foundation in the Australian colonies. In place of it was substituted a code based upon the theories at the foundation of the Australian system, yet differing much in detail. There is in fact enough variation in it and in the mining laws of the other provinces of Canada to warrant consideration of them by themselves, and this plan will accordingly be followed.

In South Africa, where the British colonists have built up a magnificent mining industry on the basis of black labor, and where the temptation has been great to introduce some form of beneficent slavery, it is vastly to the credit of the whites that nothing of the kind has been done. But, on account of the absolute non-existence of a white laboring class in that part of the world, the theory has been put into force and accepted, that all kinds of unskilled labor must be performed by natives under the direct supervision of white overseers, while the black man is legally debarred from rising above his class, or acquiring any skilled ability. This factor, together with the very peculiar conditions existing in the Transvaal and Rhodesia when they came into the possession of the whites, puts the South African mining codes into a class by themselves, and they will be so treated.

We have, then, to consider in detail, and in the order in which they arose, the Latin American system, the American system, the Australian system, the Canadian system, and the South African system. But before doing so it will be of advantage as well as interesting, to consider the ancient codes of Germany and Spain, and those which were in force in Latin America while they still were colonies of Spain and Portugal.

CHAPTER III

Ancient German Mining Laws and Customs[1]

In the time of Agricola (born 1494, died 1555), there was in practice quite a body of mining law—of its kind—in that part of Teutonia traversed by the Sudetic Alps, which at the present time constitute the southern border of Saxony and the northern of Bohemia, and which, as they are followed eastward, pass centrally through Silesia. In these mountains mining had been active already for certainly 800 years, that is, since the seventh century. From the first these laws had, of course, been nothing more than the decrees of the ruling princes who, from time to time, held the region by conquest or the accident of birth, and naturally they were promulgated with the intent of placing all the hazards of the business on the shoulders of the miner, and getting all that was possible of the results of his labor without completely discouraging him. In Agricola's period this body of decrees had become fairly liberal for their time. The chief mining functionary, who was directly responsible to the ruler, was the Mining Prefect, who also represented the last court of appeal in all affairs relating to mines in all the mining districts under the sovereignty of that ruler. Under him, in each district, was the Bergmeister, who dealt directly with the miner.

The only kind of mining property recognized was the leasehold, which, once granted, could be held indefinitely as long as the holder maintained reasonably continuous and energetic work, and paid his royalties promptly.

The unit mining claim was called a "Meer," and was an area approximately 42 feet square, and therefore about one twenty-

[1] Abstracted from Hoover's translation of Agricola.

fourth part of an acre. There were however several other kinds of meers, as follows:

The ancient "Head Meer," which was bestowed on the discoverer of a new vein as a reward for the discovery, was the equivalent of seven unit meers, placed side by side in a line along the outcrop or strike of the lode, giving a block of ground 294 feet long and 42 feet wide, and containing about one-quarter of an acre. Next was the "Long Meer," consisting of four unit meers placed side by side and forming a block 168 feet long and 42 feet wide. Finally there was the "Regular Meer," consisting of two unit meers forming a block 84 feet long and 42 feet wide. All of these were lode claims. The region was one of veins predominantly, producing mainly silver-lead ores, with which were associated more or less copper, iron, and zinc, and occasionally bismuth. All ores were sulphides or tellurides, with comparatively little associated gold. Consequently there were no placers, and no need of placer claims.

The procedure for acquiring title was as follows: A new discovery having been made, the Bergmeister, accompanied by one or more of his staff of officials, such as the T.the Gatherer, the Cashier, the Mining Clerk, etc., and also by two reputable citizens, was led by the discoverer to the new find. On arrival the latter, in the presence of the assembled witnesses, made a solemn statement asserting the facts of the discovery, all of which was taken down in writing by the clerk. If no one appeared as a contesting claimant for the ground the Bergmeister proceeded to measure off a "Head Meer," beginning at the discovery point and measuring off 147 feet along the strike in each direction, and also 21 feet on each side of it, marking the corners with posts or monuments of loose stone. Formal possession of this area was then given to the claimant. During the process each step was noted by the Mining Clerk. After this the Bergmeister proceeded to lay off at each end of this head meer a number of unit meers, the first pair of which was assigned to the local sovereign, the second pair to his wife, the third to the Master of the Horse, and succeeding ones in turn to the royal Cup Bearer, the Groom of the Bed Chamber and

finally a pair to the Bergmeister himself. All these were subsequently obtainable on lease by miners, through applications made to the Bergmeister.

Later this custom was modified by laying off the vein on both sides of the Head Meer into two meer blocks, which were allotted to miners in the order of application, each applicant having the right to select his block out of any remaining unclaimed.

On all of these claims—including the Head Meer—a royalty of 10% of the gross value of the output was payable to the government.

The width of these claims on the surface being only 42 feet, and the same being apportioned equally on both sides of the line of strike, all but veins of nearly vertical dip would require but little exploration in depth to carry the workings outside of their surface lines projected vertically downward. From this condition arose the first custom permitting extralateral rights. This, Agricola says, was of very ancient origin, and he describes its provisions as follows:

"If the vein descends vertically into the earth the boundaries similarly descend vertically, but if the vein inclines the boundaries likewise will be inclined. The owner always holds the mining right for the width of his meer, however far the vein descends into the depths of the earth."

This custom, however, applied only to that kind of mineral deposit known technically in that day as "vena profunda," which at the present time would be translated into the term "true fissure vein." For the other two kinds of deposits which he called respectively "venæ dilatantæ" (bedded veins) and "venæ cumulatæ" (a mass, impregnation, segregation, replacements or stockworks) there existed no extralateral rights; and the Bergmeister in allotting ground gave to the discoverer as many unit meers in a compact block as he thought proper, considering the relative importance of the discovery made, and the conditions under which it was necessary for the miner to operate; and to all others, in the order of application, smaller sized blocks.

To companies with capital, areas of much larger size would be

allotted, at first in the way of blocks of meers, and later as irregularly shaped tracts.

Tunnel rights also were procurable. These recognized the benefits of drainage, ventilation, and working tunnels, and compelled miners who enjoyed the resulting advantages to contribute to their cost or maintenance or both. New veins discovered in such excavations entitled the tunnel owner to a liberal portion thereof up to the surface and indefinitely downward, and protected his interests.

Nominally, continuous work, as well as the prompt payment of royalty, was required, and any one who could prove that labor had ceased for three consecutive shifts on a lease had the right to denounce and claim it. But this ruling of the sovereign power was liberally interpreted generally by the Bergmeister, and almost any reasonable explanation of default was accepted by that official in the cases of industrious and capable miners.

CHAPTER IV

Ancient Spanish Mining Laws and Customs

To understand properly the system of mining law prevailing in Latin America at the present time, it is necessary to have some knowledge of the old Spanish laws relating to the industry, and it will be advantageous first to recapitulate briefly the racial history of the people of the Iberian peninsula, for the laws that ultimately originated there were the outgrowth of the vicissitudes through which its inhabitants passed in their long struggle toward a national life. This part of Europe has been notable for its mineral wealth since the dawn of civilization there, which perhaps may be said to have begun not later than 1000 B.C., the date of the founding of the city of Gaddir on its southwest coast, now called Cadiz, by the Phœnicians. These Semitic people, and their Carthaginian successors of the same race did not invade or conquer the country, but appear to have held exclusive control of its trade until 206 B.C. when they were replaced by the Romans. The latter gave way to the Visigoths in 414 A.D., and these in their turn were dispossessed by the Arabs (Moors) in 711. This second Semitic sway continued uninterruptedly until 1031, when the Mohammedan Ommiad dynasty ended. The country was then broken up into a number of small kingdoms, some Christian and some Mohammedan, and for nearly 200 years was ravaged by the continual wars between these rival states. About 1140 the kingdom of Portugal achieved national existence in nearly its present form, and in 1212 the Christian kings of Castile, Navarre, and Aragon secured such a preponderance of power and population that the Mohammedan dominance began to pass away. Finally, in 1497, the region now known as Spain became a united monarchy under Ferdinand and Isabella. To summarize, the peninsula, originally inhabited by

people of the Celtic race known to ethnologists under the general name of Celtiberians, was under Semitic influences during nearly 800 years (1000 to 206 B.C.), under Roman for 650 years (206 B.C. to 414 A.D.), under Germanic (Visigoths) for nearly 300 years (414 to 711), again under Semitic (Arabs and Moors) for 320 years (711 to 1031), and under partial Semitic and partial native rule for a further period of 466 years (1031 to 1497).

There is little doubt that in each case the control of the region was sought more for possession of its mineral wealth than for any other reason. The Phœnicians and Carthaginians do not appear to have penetrated to any extent into its interior, or to have exercised much if any political dominion there. But they established cities along its coasts, and traded extensively with the natives, giving in exchange for the gold, silver, and cinnabar, which the latter procured so easily, the various products of far eastern civilization which were highly prized in those days by the primitive people of western Europe. The Romans, however, took physical possession of the land and its inhabitants, imposed their civilization upon it, worked its mines vigorously with slave labor, and regarded the peninsula as one of the most desirable parts of their Empire.

The Visigoths, being of Germanic stock, and coming from a part of Europe which even at that early date had some little reputation for mineral wealth, must have been attracted towards the conquest of the country because of its superior resources in this respect, and may have brought with them some little knowledge and experience in the industry. But the Roman civilization they dispossessed was far in advance of their own, and while they held the peninsula they appear to have completely adopted Roman laws and practice in the conduct of such mining operations as they carried on, or permitted to the inhabitants.

Nor did the Moors, when they held the land, make any changes of importance in the laws pertaining to mining. No branch of the Semitic race has ever been notable in that line of industry. They appear, however, to have done much indirectly to foster mining, principally by permitting much freedom of operation to

those engaged in the occupation, and by a vigorous development of the great natural agricultural resources of the country, which had the effect of making labor cheap, abundant, and contented. During their dominance Iberia enjoyed a prosperity greater than any that preceded or has followed it, and to their encouragement of letters and the gentler arts may be ascribed the fact that we have, to-day, so complete a record of the system of mining jurisprudence prevailing during those early days. Nothing equal to or even approaching it has been preserved in any other part of the world.

During the 600 years when Spain was a Roman province, the common laws of that Empire took firm root among its people, and when the Visigoths took possession of the peninsula they considered the laws so satisfactory and adequate that they caused to be promulgated a compilation of all then in force in the country. This compilation is known as the Code of Alaric, and is regarded by Spanish jurists as the foundation of their system of jurisprudence. It was published towards the close of the 7th century, say about A.D. 675, shortly before the rule of the Visigoths began to give way to that of the Arabs.

The Arabs, or Moors, advanced into the Iberian peninsula from Africa, and during the 300 years when they were in complete control of the country mining flourished greatly along with agriculture and other industries, and the land became very rich and prosperous. It is generally believed by Spanish writers that towards the end of this period (975–1000 A.D.) what is known as "The Old Code of Castile" was compiled, consisting very largely of decrees promulgated from time to time during the preceding two centuries to provide for the necessities of the developing country, many of which had to do with the business of mining.

After this, and during the stormy period between 1031 and 1212, while Moorish power was declining and the peninsula was greatly disturbed by civil wars, mining operations were much impeded, and a great many of the famous properties of the day were flooded and wrecked. But by 1350 conditions began to mend, and new decrees affecting the industry became necessary.

Some of these are found in the famous "Siete Partidas" a compilation which was published in 1348.

It will answer our purpose now simply to mention the names of the principal Codes that, one by one, succeeded each other. The first is known as the "Ordenamiento de Alcala" which appeared also in 1348 and is considered by Spanish jurists as a sort of supplement to the "Partidas." This was followed by the "Ordenamiento Real," which appeared a few years before the discovery of America. Following this was the "Leyes de Toro" in 1505, and the Nueva Recopilacion, the first edition of which appeared in 1537. Subsequent editions of this work bear the dates 1581, 1592, 1598, 1640, 1723, 1745, 1772, 1775, and 1777, each supposed to be an improvement upon the one of prior date by the inclusion of the royal decrees issued meantime, and the deletion of those repealed. Finally, in 1805, came the famous work called the "Novissima Recopilacion de la Leyes de Espana," which is now the fundamental code of Spanish law except as to such decrees as have since then been repealed, amended, or otherwise altered by the Spanish Cortes, or national legislature.

Previous to the appearance of this notable compilation, such decrees of the various ruling dynasties in the Iberian peninsula as applied to the industry of mining were scattered through the various Codes without any other system than that of the natural sequence of dates. But in the "Novissima" all laws of this class are collected together, and, so far as I have been able to ascertain, they constitute the oldest body of such laws extant and in a form that at the present time would be regarded as a Code. It includes decrees dated all the way from 1263 to 1790, but only those up to the date of 1584 refer to the ancient laws which were in force in Spain when the new world was discovered, and which naturally were transported to Spain's colonies there. In 1761, a noted Spanish jurist named Don Francisco Xavier de Gamboa published a voluminous commentary on some of these old decrees, which throws many an interesting side light on the doctrine of mining rights and obligations of his day.

It is of course out of the question in this work to quote all these

old decrees, many of which refer to the mining of non-metalliferous minerals, with which we are not concerned; nor even to quote in full those bearing directly on metal mining, for the legal style of the times in which they were written was very verbose and redundant, including phrases and sentences touching on social, political, and governmental conditions long since passed away, and having no bearing on the present inquiry. Hence, what follows are pure digests or abstracts. Great care has been taken in preparing them, and the author believes that what has been retained represents accurately the true intent of these ancient laws. Those who wish to study them in their full form are referred to "Spanish and Mexican Law," by John A. Rockwell, published in 1851 by John S. Voorhies of New York; or to "Mining Laws of Spain and Mexico," by H. W. Hallack, A. M., published by O'Meara & Painter of San Francisco, in 1859. The first mentioned contains the valuable and interesting commentary by Gamboa on the 4th law, which is really the only one that has to do with the business aspects of mining.

LAW 1

DECREE OF KING ALONZO XI. PROMULGATED IN THE YEAR 1383. ABSTRACTED

All minerals of gold, silver, lead and every other metal whatsoever in our realms belongs to us; therefore no one shall presume to work them without our especial license and command; wherefore we command that the rents derived therefrom be paid to us, and that no one presume to intermeddle with them, except those to whom former kings, our predecessors, or we ourselves shall have granted the privilege, or who shall have acquired them by immemorial possession.

LAW 2

DECREE OF KING JUAN I. PROMULGATED IN THE YEAR 1387 AT BIRBISCA. ABSTRACTED

Inasmuch as we are informed that these our kingdoms abound and are rich in minerals; therefore, as an act of grace to the inhab-

itants of the same, notwithstanding that there has been reserved by us minerals of gold, silver and other similar metals; it is our pleasure that henceforth all persons whomsoever of these our said kingdoms, may search for, examine and may excavate their said lands and estates, and remove from them said minerals of gold, silver, quicksilver, tin and other metals, and that they may search for minerals in all other places whatsoever, not prejudicing in their searches and excavations the rights of other persons, and acting with the permission of the owner; and all the minerals which shall be thus found and extracted shall be divided as follows: First, there shall be delivered and paid therefrom to the person who extracted the mineral, all expenses of excavating and extracting; and of the remainder, the said expenses having been deducted, the third part shall belong to the person extracting the mineral, and the other two parts to ourselves.

LAW 3

Decree of King Philip II of Spain at Valladolid. Promulgated January 10th, 1559. Abstracted and Put into Modern Legal Form

Whereas, it is very well known that great benefit to our royal patrimony and to our subjects and citizens has, at times in the past, resulted from the discovery and working of mines of gold, silver, quicksilver and other metals, in which we are informed these kingdoms are very rich; and:

Whereas, by the law which was promulgated by King Juan I in 1383, the right was granted to all persons to explore for and work all the minerals in this kingdom, and:

Whereas, experience has shown that very few mines have been or are likely to be discovered and operated under its provisions, and:

Whereas, it is said that there are persons who have knowledge of the existence of rich mines but will not make known their location because they are in regions that have been granted to noblemen, bishoprics, archbishoprics and provinces, by

which process almost the whole public domain has been alienated, and:

WHEREAS, these grantees just mentioned were given exclusive exploring and working privileges, and now display little or no inclination to exercise the same or allow others to, so that we, our subjects and citizens are deriving no benefits therefrom, and:

WHEREAS, others will not engage in mining on these grants, although, by the decree of King Juan the division of profits was arranged, yet the law is so ancient and has been so little used that men of means hesitate to risk their money on the strength of it; besides which, many questions have arisen under it which have never been judicially decided:

Now, therefore, to clear up all these difficulties, and to make the investment of capital in mining an occupation as free as possible from legal hazard and other vexations; and having conferred with the members of our Council on the subject, it has been decided to promulgate the following decree.

First.—We declare void and resume in ourselves the titles to all mines of gold, silver and quicksilver in this our kingdom, wherever situated, whether in public or private land, and notwithstanding the grants heretofore by our ancestors or ourselves made, to anybody, or for any cause, doing so for the reason that said grants have been prejudicial to ourselves, and to our subjects and citizens. Provided however, that in such cases where mining operations in good faith are now in progress, this decree shall be without force and effect. However, in all other cases we propose to indemnify grantees for the nullification of their privileges herein decreed, after due examination of their title, and to such an extent as may seem just and reasonable under the circumstances.

Second.—Inasmuch as this resumption in ourselves of our rights in these metals and minerals is not that we, or others in our name, may explore for, excavate and operate mines, but that our subjects and native citizens may have the opportunity to do so under fair conditions, and in all parts of our royal domain (paying proper damage to owners when upon privately owned land), and

may be relieved of all vexatious questions of title; and therefore, to all our said subjects and citizens who may hereafter discover and register claims on mineral deposits, in accordance with provisions hereinafter to be declared, full, free and exclusive right is hereby granted to operate without obstruction by ourselves or any other person, within the boundaries of the same, upon compliance with the regulations hereinafter to be declared, and so long as the royalty as heretofore arranged is promptly paid into our royal treasury.

PROVIDED however, that there be excepted from the provisions of this decree the mines of Guadalcanal and one league around them, and the mines which are already discovered within the limits of the Cazalla, Aracana and Galarocca districts, and a quarter of a league around each of them.

DIGEST OF THE SPANISH MINING LAW AT THIS DATE (1559)

Prospecting free.

Discovery of ore a requisite before a valid location could be made or recorded.

Record required (to be made in person before a Royal Notary, or in the Court having jurisdiction over the region in which the claim was located) within twenty days after making discovery. The act of recording or registering consisted in giving the name of the discoverer, the date of discovery, a reasonably good description of the situation of the claim, and a sample of the ore found.

Size of claim allowable, about 275 feet along the vein, by 137 feet in width.

Within six months from date of record the claimant must sink a shaft 33 feet deep on the vein, after which work must be reasonably continuous in order to maintain title. Suspension of labor for four months continuously automatically constitutes forfeiture of all rights.

Royalty 66⅔% of net profits.

Decree of March 18th, 1563.

Promulgates a new scale of royalties, as follows:

For Silver.

	Per cent.
Bars yielding up to 144 ounces per ton	12½
Bars yielding from 144 to 432 ounces per ton	25
Bars yielding from 432 to 864 ounces per ton	33⅓
Bars yielding over 864 ounces per ton	50
Silver recovered from old mine dumps	20
Silver recovered from old slag heaps	5
For Gold, from any and all sources	50
For Copper (figured on weight of crude ingot)	5
For Lead (figured on weight of crude ingot)	6⅔
For Antimony (payable in the ore)	12½

Size of discovery claim placed at 330 by 165 feet.

Size of ordinary claim placed at 275 by 137½ feet.

The actual discovery of ore not necessary as a preliminary to the location of a claim alongside of another claim containing a vein dipping out of it, but the locator thereof must use all possible diligence in sinking his exploring shaft in which he expects to cut the vein, and while doing so will be protected in his rights.

The locator of a vein which is dipping out of his ground, having followed it to his side line and beyond into unoccupied territory, is permitted to locate a new claim alongside of the other to protect the vein, by virtue of the underground discovery so made.

Location of ground for another, by power of attorney, permitted. Also for a servant or employee, without power of attorney.

In the case of silver or gold recovered by the use of quicksilver, the amalgam must be brought to the Government refinery, and the distillation of the quicksilver effected in the presence of an official.

Mines in litigation not allowed to be kept inoperative for a period greater than 40 days. Within that time the Judge must reach a temporary decision on the basis of the evidence then placed before him, and must place the winning party in possession, allowing to the loser full rights of appeal, and of the presentation of further evidence, and imposing upon the temporary winner the obligation to keep accounts, and to retain all profits intact until final decision is reached.

Size of discoverer's gold claim (alluvial or quartz), placed at 137½ by 68¾ feet, with the obligation to locate one of same size for the King alongside of his own, on which, however, the discoverer had a prior call for a lease.

Decree of August 10th, 1564.

Repeals all former laws so far as they may be in conflict with this one, and promulgates the following changed schedule of royalties.

For Silver.

	Per cent.
On bars yielding 216 ounces or less per ton of 2000 pounds	10
On bars yielding over 216 ounces and not over 576 ounces	20
On bars yielding 576 ounces and not over 864 ounces	25
On bars yielding 864 ounces	50

Registration made obligatory within ten days of the date of discovery.

Miners allowed to locate an unlimited number of claims, and with no obligation to reserve any for the King.

All discovery claims to measure 440 by 220 feet, and all others 330 by 165 feet.

Miners allowed free timber cutting rights on public lands, and also on private lands, but in the latter case coupled with the obligation to pay a reasonable price for the timber taken, according to appraisement by the local Judge. They were also granted all necessary rights of way over private lands, and reasonable grazing privileges on the same.

Free fishing and hunting privileges within three leagues of the mine or furnace granted, together with the right to utilize the water of streams for power purposes, provided that when such powers were used at places where the stream was passing through private lands the owners of the same should be fairly recompensed for the privilege.

Owners of furnaces who were able and desired to reduce therein ores from other mines, as well as their own, were allowed by the provisions of a special license to do so on condition that the ores were to be smelted separately, and that the ingots or bars of

crude metal as produced should be stamped with a registered letter or mark, indicative of the ore which, for the time, was undergoing reduction.

A further special license was also procurable which permitted the mixing of ores from two or more mines, but only upon condition of allowing the government engineers and assayers full access at all times to the works and to the accounts, with the right to take samples whenever desired so as to be able properly and correctly to assess and collect the amount of royalty due from each contributor to an operation of that kind.

A new dimension was ordered for the gold claim, to wit: for the discoverer's claim, 220 by 110 feet; for the ordinary claim, 200 by 100 feet.

Tunnel rights for drainage, for coöperative mining and transportation, and also for purely exploratory purposes were decreed, giving the excavators of such enterprises full privileges of cutting through and under all claims along its line. The drivers of tunnels acquired thereby the sole ownership of all ore encountered to the extent of the size of the tunnel, which could not exceed 66 inches of height and 165 inches of width. But, when a lode was cut, the tunnel owner had the right to run a drift upon it as large as the tunnel, and to continue driving upon it, and to own all the ore excavated during the operation, until the owner of the vein connected his workings with it.

LAW 4

DECREE OF KING PHILIP II OF SPAIN, AT SAN LORENZO. PROMULGATED AUGUST 22ND, 1584. ABSTRACTED AND PHRASED IN MODERN STYLE

Section 1.—Law 3 is repealed, excepting such parts of it as provide for the resumption in ourselves (the King) of all title in mines of gold, silver, quicksilver and other metals and minerals; also all other laws and decrees heretofore promulgated that are in conflict with this law.

In Gamboa's comments on this section it is stated that although

this law was framed and promulgated primarily to govern the operations of the mining industry of Spain, yet copies of it were sent to the Viceroys of all the provinces of New Spain in America, with the instuction that it be published there, and put into practice, wherever it did not conflict with viceregal decrees already issued and approved by the King. This was done, and it will be found that its fundamental principle, to wit, the absolute and even personal ownership of all metals and minerals by the King—who was afterwards replaced by the State—has remained in force and effect in all the modern laws of the nations into which the dominion of Spain was broken up when these provinces, one by one, attained independence, in the early years of the nineteenth century.

The final paragraph of Gamboa's comments on this section is worth quoting verbatim. He says:

"There is no need to have recourse to other nations for mining ordinances; our own are amply sufficient. In framing them recourse was had to the laws of Germany, as stated and explained by Agricola, although the mines (claims) of that country differ from ours in the dimensions assigned to them, and in the modes of handling them when held by partners. It cannot be denied that the laws of the State of Hesse are very copious, little less so indeed than those of the Palatinate, but almost every contingency is comprehended in and provided for by our own."

From these remarks it would appear that although the mining districts of Germany could not compare in antiquity or richness with those of Spain, yet in the former rules and regulations to govern the operations of the industry had been worked out in detail before the same process had taken place in the Iberian peninsula. There is nothing to indicate that in fundamentals either had borrowed from the other.

Section 2.—Complete possessory and conveyancing rights are granted to discoverers of mines, so long as the provisions for reasonably continuous working are complied with, and the royalties paid. In the case of a discovery made upon alienated

land, security must be given that the surface owner will be fairly indemnified for any damage that might result from mining operations.

In commenting on this section Gamboa mentions the fact that prospecting and claim location was not, at first, free in Mexico, to the natives nor even to the Spaniards. A permit of some kind was necessary, and this was obtainable only at the pleasure or discretion of the local judge. Finding that the natives concealed their knowledge of promising outcroppings, and that the Spaniards would not prospect, the Government not only authorized free prospecting, but offered large rewards for all valuable finds. Decree to this effect was made by Emperor Charles, and dated December 9th, 1526.

Sections 3 to 15. Royalties.—Royalties on the precious metals are receivable only in the form of the refined metals themselves. On the base metals they may be paid in the condition of the crude ingot. The business of smelting ores is free and open to all. But the separation of the precious from the base is reserved as a Government monopoly, and refineries, properly equipped, are established at all the principal mining districts. To the nearest of these the miner must bring his bars of silver-lead or silver-copper for the separation of the metals, and royalties will be collected on the arriving weights of the former according to the following schedules.

For Silver.—On bars yielding 1½ marcs (or less) of silver per quintal—equivalent approximately to 216 ounces per ton of 2000 pounds—10%.

On bars yielding over 1½ marcs and not over 4 marcs—equivalent approximately to from 216 to 576 ounces per ton—20%.

On bars yielding over 1½ marcs and not over 6 marcs—equivalent approximately to from 576 to 864 ounces, 25%.

On bars yielding over 6 marcs, 50%.

For Gold. From all sources, quartz, alluvial or smelted, 50%.

For Copper and Lead. 20%, payable only in the metal.

At the time it was the custom in Spain for the miner to be his own smelter, which was made possible by the fact that only the

very simplest kinds of ore were treated, of which there was at one time the greatest abundance.

Other scales of royalty, less severe, were arranged by special dispensation for those who undertook the reopening of old and long abandoned mines; and also in the case of ore of very low grade in the precious metal.

By decree of August 18th, 1607, the royalty on all mines producing gold or silver, or both, was reduced for a period of ten years to one-fifteenth, or 6⅔%, and for the next following decade to 10%, with the proviso that at the end of this 20-year period the royalty might be again raised, but would never thereafter exceed one-fifth, or 20%.

Because of a lack of knowledge at the time as to how to reduce antimony ores to the metallic state (which in fact was not accomplished until 1740), the royalty on pure ores of that metal was accepted in the form of ore.

In 1569 many foreigners, mainly Germans, were employed by Spanish individuals and companies in conducting their mining operations, native talent in that line being very low. Also mines were leased to foreigners.

Section 16.—Prospecting and digging are free on all lands, either public or private, and without permit, but any damage on private land made by such work must be paid for. No royalty payable to surface owners.

Section 17.—Registry required within 20 days of date on discovery stake, before the Judge of the Court having proper jurisdiction in the District. The claimant must produce a sample of the ore disclosed by his excavations, must give his name and personal description and date of discovery, and describe the locality with reasonable exactitude and state details of digging performed. Within 60 days thereafter he must deliver a copy of this, duly certified by the local authority, to the chief government official of the Department, after which, and during another period of 90 days, he must sink a shaft on the ore to the depth of at least 33 feet, approximately. Having done this, and having determined by his explorations to that date how he desires to lay

out his ground, he must file a petition asking to have his boundaries marked out. The Government then orders an examination of the premises by an engineer, who, if everything has been done by the claimant that the laws require, places his corners and puts him formally in possession.

The discovery shaft must be 66 inches deep and 33 inches wide, and the discovery stake must be firmly set in it, not along side of it. This discovery stake could not be moved after once being set.

The personal attendance of the claimant for the registration act was not specifically required, although considered most advisable. The act could be performed by any duly authorized Agent.

Apparently there was no limit to the number of claims that an individual could acquire, except that he could take only two adjoining claims upon a vein, and must then leave the space of three claims vacant before staking out another two. But if a partnership of two or more existed, four or more claims (according to the number of partners) could be staked on the same vein; but, as before, a length of the vein equal to three claims must be left at each end of such a group location, before another group location could be made.

The size of the regular claim was 165 feet in length, by 87½ feet in width. But the discoverer of a new vein was allowed to locate two claims thereon, contiguous, each of which might measure 220 feet in length by 87½ feet in width.

A claimant must stake his ground within 10 days after erecting his discovery stake, but no valid discovery could be made, or stakes set up, until ore had actually been found.

The discoverer of a new vein was allowed to lay out his ground either along or across the strike of the vein, as he preferred, and all other following locators were permitted to do the same. All claims to be rectangular in shape.

This provision was for the purpose of allowing the miner to secure more of the underlay or dip of the lode than of its strike, if he preferred to do so; also to enable him to cover wide outcrops or blowouts, or segregations or stockworks.

When the miner, following ore, either along the strike or on the dip of his vein, or on any line between the two, passed his boundaries and entered the claim of a neighbor, he had the right to continue working until he connected with the workings of the neighbor, and remove and own all ore broken down up to that point. But as soon as connection was made, thus proving the two veins to be identical, the explorer was required to withdraw to within his own lines. When such a connection was made on the dip, the same rule applied, unless the connection was made outside of the boundaries of both claims and in unoccupied territory, in which case each miner could hold up to the point of connection or intersection. Beyond that the ground (in vacant land) belonged to the one who first made a claim for it.

The obligation to sink on the vein to the depth of 33 feet within three months after registration was mandatory, and no conveyancing right whatever existed until that amount of development work was done.

Possession was maintained by keeping four laborers per day at work. Failure to do this during four consecutive months automatically worked forfeiture.

The Spanish verb "denunciar" and its derivatives have, in many English renderings of Spanish legal documents, been translated by the use of the English verb "to denounce" and its derivatives; and in common parlance among English speaking mining men the act of locating a mining claim in a Spanish American country is generally spoken and written of as a "denouncement." Some little misunderstanding has thereby resulted. The two verbs, although derived from the same Latin root, convey among the two people somewhat different meanings. With the Spanish, "denuncio" means "I advise, give notice, lay information against," but not necessarily charging the doing of an illegal or wrongful act. With the English "I denounce" means "I publicly accuse, declare as deserving of punishment," the implication being that a legal or moral wrong has been committed. Bearing in mind this difference of meaning will make it easier to apply the proper words in dealing with the verbiage of

Latin American mining law. When a claim is located in a Spanish American country on a new discovery, the process of doing so is more correctly described in English by the use of the word "locating," for, under the circumstances the Spanish American miner never speaks of the act as a "denuncio," or denouncement. But when a claim has been automatically forfeited by neglect on the part of the owner to perform the work required by law, or to pay the prescribed royalties, it may then be acquired by the first party who applies to have it registered in his name, and the act of so doing is then properly spoken of as a "denouncement," for the new claimant, in making his application, gives notice to the Government that the provisions of the law have not been complied with, and that consequently the first claimant has forfeited his right to possession.

Decree of August 18th, 1607

Promulgates a new scale of royalties, to apply on gold and silver from all sources, as follows:

For the next 10 years, 6⅔%.
For the succeeding 10 years, 10%.

The government reserves the right at the end of the 20-year period of advancing the rate to 20%, but with the promise that no further advance should ever be made.

Repeals all decrees prohibiting the mixing of ores in smelting, and allows complete freedom in such matters. Abandons the Government monopoly in refining and in the reduction of amalgam, and authorizes the Commissary of the Treasury to take all such matters up with the individual producers, and make such agreements with them as, in his opinion, will give the greatest possible encouragement to the industry of mining, and at the same time secure from it the highest possible amount of revenue.

ABSTRACT OF THE SPANISH MINING LAW OF APRIL 11TH, 1849

All substances with which mining has to do belong to the State, and the same cannot be excavated and taken away without per-

mission of the government, and in the manner prescribed in this law.

No claim may be located until a discovery of ore is made.

Claims whose location acts have been approved are granted for unlimited time, subject to the provisions of the law, and cover all mineral substances except quicksilver and salt, which are held to be government monopolies.

Prospecting is free to all, natives and aliens, and upon all classes of land, whether public or private, so long as the work is limited to shallow trial pits not over 33 inches in depth and 11 feet square in surface area. But even such excavations cannot be made nearer than 140 feet to a building, or a piece of cultivated or enclosed land, or public property, without the permission of owners. If permission is refused and the explorer is willing and able to give bonds for possible damages, he may secure the necessary authority from the Government.

On all claims located on private lands the owner of the same has the right to demand a one-tenth interest (in expense as well as profits) if the right is exercised within two months after notification of a discovery.

If the explorer desires to sink deeper than 33 inches on private land, he can obtain the right to do so by giving proper security to interested parties. The first applicant to explore in depth on private land can secure exclusive rights for a year to do so over such an area as may be legally located, which area must be delimited within three months. If, at the end of the year, he has worked with reasonable diligence and energy on this area, the local authority, after due examination, and in consultation with his associates, will extend his time as long as reasonably energetic work is maintained. On such a claim the surface owner has no right to demand any interest.

The unit mining claim is 825 by 550 feet in area. An individual can locate only two of these contiguously on the same vein, but a partnership of four or more may locate three of them. If an entirely new vein is thus discovered, the discoverer is entitled to one more full claim.

All claims must be rectangular in shape.

Fractions between claims of less than two-thirds normal area, are to be divided up proportionately between the adjoining properties, but when such fractions contain more than two-thirds of a full claim, they may be located as a claim, if desired.

The possessory title to a mine is maintained by keeping a minimum of four men at work during a total of eight months of the year.

Work cannot be suspended on a mine without first giving notice of the intention to the local authority, and allowing him time sufficient to have it examined and surveyed, if deemed by him advisable.

On all located claims work in earnest must begin within six months of date of registration. Failure to do this, and to prosecute work as mentioned in the foregoing paragraph, automatically results in forfeiture of title.

All claims must be registered before the political chief of the district, and not more than two unit claims may be included in one registration, except in the case of a new discovery, or a partnership. The details of the process of registration are complicated and long drawn out, and may become expensive.

Placer claim areas cannot exceed about 82,500 square feet, and must be marked out in the form of a rectangle.

Claimants are under obligations to keep their monuments in good condition and repair.

OLD SPANISH DECREES RELATING TO THE MINING INDUSTRY IN SPANISH AMERICA

King Charles, December 17th, 1551.—Directs that natives shall have the same right to discover and work mines as is enjoyed by the Spaniards and the mestizos.

King Philip II, May 23rd, 1559.—Indians allowed equal rights with Spaniards in prospecting for, locating, and working mines.

King Philip II, May 8th, 1572.—The exportation of quicksilver from Spain to Mexico and Peru, or from Mexico to Peru, or from Peru to Mexico, is prohibited to all private parties, as

the Spanish government reserves the quicksilver industry as a government monopoly. Even when the metal is collected by distillation from amalgam it must be turned over to the local mining official at a price to be determined by him.

King Philip III, November 26th, 1602.—The mining laws and practice current in Spain are to be made the laws of Spanish America wherever possible, and when not inconsistent with laws already enacted there.

King Philip III, March 29th, 1621.—Clerics and religiosos not allowed to own or work mining property.

King Philip IV, March 28th, 1633.—We ordain and charge the Viceroys, Presidents and Governors, that they exercise particular care and diligence in ascertaining if, in their districts, there be any mines of gold, silver or other metals, of which the Indians have or can obtain knowledge, and that, after due inquiry and advice, they cause to appear before them the Indians of the most reliability, in order that these, personally, and others who may have more skill and intelligence, may give information about the places and positions where it has been understood there are mines which are concealed in order that they may not be worked (although such working really results to their benefit), because they are naturally inclined to idleness; and that they be assured in our name that, for their care and trouble, if successful, there shall be granted to them, and henceforth there are granted to them, many rewards and exemptions; and especially that henceforth they shall not be assigned to work in any mines, and that they and their descendants shall be forever exempt from personal taxes; and, if they are Spaniards or mestizos, they shall receive gifts corresponding to their rank.

King Charles III in 1783.—Preamble (condensed). The mines are the property of my Royal Crown, by their nature and origin.

Without separating them from my Royal patrimony, I grant them to my subjects in property and possession, in such manner that they may sell, exchange, pass by will either in the way of inheritance or of legacy, or in any other manner dispose of all

their property in them upon the terms on which they themselves possess it, and to persons legally capable of acquiring it.

Be it understood that this grant is made upon two conditions: First, that they (my subjects) shall pay to my royal treasury the proportion of metal reserved thereto; and secondly, that they shall carry on their operations in the mines in accordance with the provisions of these ordinances; on failure of which, at any time, the mines of persons so making default, shall be considered as forfeited, and may be granted to any person who shall denounce them accordingly.

Digest of Law

The first discoverer of a new vein in a new district is entitled to locate three claims on the principal vein, and one on each of the other veins subsequently found by them. But when a new vein is found in an old district, the discoverer may make only two locations upon it.

Within 10 days after discovery application must be made to the nearest mining Judge or District official, giving all details of the situation and circumstances. Copies of this notice must be posted in public places for 90 days, during which period the applicant must sink a shaft 30 feet deep on his vein, and offer it for inspection to an officer of the Court, who, on approving the exploration as to its sufficiency as the basis of a legal claim, shall survey the area asked for, and set the corner posts. If no objection has been filed within the period of publicity, this officer shall place the applicant in possession, and give him a written document evidencing his legal ownership thereto.

If the vein discovered is on privately owned land, the claimant must pay this surface owner for such surface rights as he may need, the amount to be settled by arbitration.

The same procedure is provided for all other classes of mineral deposits, including alluvial or placer deposits.

Parties other than original discoverers are allowed to locate any number of claims anywhere, except that the location of two contiguous claims on the same vein is not permissible.

These regulations are to apply to precious stones, salt, coal, bitumen and all metals except mercury, which latter the Government reserves the right to take over, paying proper compensation for the same.

Prospecting and mine ownership are free to all Spaniards and legal citizens of Spanish America, but prohibited to foreigners until they become naturalized.

The length of the claim unit shall be 550 feet, measured along the course of the vein. Its width, in the case of a perpendicular vein, shall be 225 feet. If, however, the vein as shown in the preliminary exploring shaft shows a dip, the angle of the dip is to be determined by the examining government engineer, and the width shall then be increased according to the following rule:

When the angle of divergence from the perpendicular is 10° by 112½ ft.
When the angle of divergence from the perpendicular is 15° by 125 ft.
When the angle of divergence from the perpendicular is 20° by 137½ ft.
When the angle of divergence from the perpendicular is 25° by 150 ft.
When the angle of divergence from the perpendicular is 30° by 162½ ft.
When the angle of divergence from the perpendicular is 35° by 175 ft.
When the angle of divergence from the perpendicular is 40° by 187½ ft.
When the angle of divergence from the perpendicular is 45° by 200 ft.

The locator has the right to take any part or all of these widths on the side towards which his vein inclines.

Miners are permitted to move their corners and lines (but not to increase their areas) if it can be done without injury to neighbors. But all such changes must be effected with the cognizance and permission of the local authority.

The old law, allowing the miner to follow his lode into the territory of another, until he connects with the workings of the latter, is repealed.

The Tribunal of Miners is created, to consist of Spaniards or their American descendants of unmixed blood.

After boundary lines are set the miner has the exclusive right to all veins within the same.

If a miner fails to keep at least four men at work on his prop-

erty during at least eight months of the year, forfeiture of the title automatically ensues.

The miner may not abandon his mine without first giving notice of his intent to do so to the local authority, and then allowing sufficient time for the latter to examine, measure up and survey the workings, and publish the intention of abandonment.

Royalties, on gold and silver, 20%.

CHAPTER V

Mexican Mining Decrees from 1821 to 1883

These will be found interesting and of importance as showing the successive steps taken in the gradual process of clearing away the repressive features of the mining laws that were in force while Mexico was yet a colony of Spain, thus preparing the ground for the present very liberal regime. The period was one during which the country was desperately in need of metallic money. It was imperative to foster and encourage the mining industry in every possible way, even to the extent of allowing foreigners to become interested. In no other country of the world—except perhaps China—has the unreasoning hatred of the alien been so strong. The most disliked and feared of all was the Spaniard. The antipathy to the American was almost as great, especially towards the latter end of the period. The German was the most favored, but the arrivals of that nationality had no inclination towards mining, and rarely brought any capital with them or could command it. The English were the explorers and investors of the day and were eager for mining adventure in any part of the world. Much new money came to Mexico from Great Britain during this period of its history, and unfortunately almost all of it was lost to the investors.

November 22nd, 1821.—To encourage mining, all former duties and taxes on the industry were abolished, and a uniform duty of 3% on fine gold and silver substituted.

Quicksilver and explosives were relieved from all forms of taxation.

October 7th, 1823.—The law prohibiting unnaturalized aliens from acquiring and working mines was suspended. In its place it was provided that native mine owners needing capital for

mining purposes were permitted to borrow from foreigners, and to give such security as might be demanded, even to a mortgage on a mine, or the shares of a mining corporation. But even then the alien could not register or denounce a mine, nor buy its shares.

February 13th, 1824.—The importation of quicksilver from any source was made free.

May 20th, 1826.—The Tribunal of Miners was abolished.

May 16th, 1842.—Aliens residing in the Republic were authorized to discover, register, denounce and hold mining property, and work the same. Such aliens were relieved from military duty, but must pay the military poll tax, and must consent in all ways to live under Mexican law. If such an alien absented himself for two years from the country, without permission from the government, or if by death his property descended to non-resident aliens, it could be condemned and sold. The right to own and work mining property did not include discoveries made upon the Public Domain. But if such a discovery was made by an alien, he could obtain the right to own and operate by direct arrangement with the Government in the form of a concession, under certain conditions.

May 31st, 1843.—A reward of $25,000 was offered to each of the four mining proprietors who produced, in one year, from Mexican mines, 2000 quintals (about 100 tons) of quicksilver, which the Government offered to buy at the rate of $5 per quintal. All workers in quicksilver mines were relieved from military duty.

Digest of Mining Law Promulgated December 15th, 1883, under the Presidency of Manual Gonzalez

Prospecting is free on all lands of the Republic, by open excavations not over 15 feet in depth, or by drilling to any depth. But where the explorer desires to conduct his operations on privately owned land, the consent of the owner must first be obtained. If it is refused, the explorer may secure from the Government a permit, good for 30 days, with reasonable extensions for as long time as he can show the necessity for the same.

The unit claim for a vein is 200 meters long, and 200 to 300 meters wide, according to the inclination of the vein as determined by the government expert who examines the preliminary excavations when application is made for permanent registration.

The placer claim area is 20 meters square.

The claim for segregated and bedded-vein deposits is 300 meters square.

The claim for an iron ore deposit is 1500 meters square.

The discoverer of a new vein or deposit in a new district may locate three contiguous unit claims upon it, and one upon each of the other veins discovered by him in the same locality. But when the discovery is of a new vein in an old district he may locate only two claims upon it, which also must be contiguous.

In the case of alluvial or bedded deposits, the discoverer may also take three units.

All succeeding locators, in both cases, are confined to the location of one claim only, on each vein discovered.

Registration proceedings before the local Authority are allowed at the convenience of the locator, and also at his peril, for, under similar conditions, the ground is awarded to the first applicant.

Registration once effected, the grant is for unlimited time, subject to annual labor conditions calling for the employment of six men per day during not less than six months of the year, continuously or interrupted, according to the convenience of the claimant, and the prompt payment of the government royalty, which shall not exceed 2% gross.

CHAPTER VI

The Latin-American System of Mining Law. Digests of the Mining Laws of Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Peru, Uruguay and Venezuela. Results of the System. Statistics of Metal Production from 1851 to 1916

THE LATIN-AMERICAN SYSTEM

The mining laws of this category are those of Mexico, of the six republics of Central America (Guatemala, Honduras, Nicaragua, San Salvador, Costa Rica and Panama), of Cuba, and of the ten republics of South America (Colombia, Venezuela, Brazil, Paraguay, Uruguay, Argentina, Chile, Bolivia, Peru, and Ecuador). These are all based on doctrines of land tenure inherited from Spain or Portugal, which in turn trace back their conceptions thereof to Roman law.

The Roman doctrine seems to have been about as follows:

That when a new terrain was added to the Empire, the property rights of those dwellers therein who submitted without resistance to the new sovereignty were recognized and confirmed as to everything at and on the surface, but all beneath the surface—whether on occupied or unoccupied land—passed to the Empire because it had not been specifically claimed or properly utilized by the soil owner or the conquered state. The warrant for the latter doctrine was based upon the fact that whatever mining had been done in South-western and central Europe before the arrival of Roman sway appears to have been conducted on areas or regions regarded as common property, to which all had free access, and from which anyone could take whatever he

could find, so long as he did not interfere with similar operations by another. From this generalized concept two theories descended upon Europe when the Empire broke up. One of these was that the sovereign power owned all beneath the surface under all circumstances, but that a surface occupant had a right to claim damages for any injury that might be inflicted upon his particular part of it by mining operations; and, the other was that the surface occupant was the absolute owner of both surface and underground, but if he did not utilize the latter and a third party wished to do so, the exclusive privilege of doing so could be claimed.

The first of these principles seems to have prevailed in those parts of the Empire where Roman dominion continued long enough to impress its customs and language permanently upon the people, which was particularly the case in those regions now called Spain and Portugal. The second prevailed where Rome failed to impress its customs and speech to that extent, as in the British Isles and among the people of Teutonic and Slavonic speech.

In Spain, which is a very highly mineralized region, and where mining has been an industry of importance ever since the Roman occupancy, the first doctrine has always been very strongly held. This is interestingly shown by a decree of Alfonso XI, promulgated in 1383, claiming personal and absolute property not only in the precious metals but in all others, whether existing on privately owned land, or on what remained then of the public domain. It was held with equal strength in Portugal, and was therefore naturally transplanted to the colonies of the two people in the new world. Similarly, the social views then current in these two countries were impressed upon the native populations of the colonies, with which, in due time, the Latin stocks have become more or less amalgamated.

We find this principle then, slightly modified here and there, and more than anywhere else in Mexico because of its adjacency to a nation of another race and culture, at the foundation of all Latin-American mining codes. Because of it, in these lands the

doctrine everywhere holds good that whoever proposes to engage in mining must first go to the government, and seek for a concession for such areas as are desired. This being considered the only normal way of initiating business of this kind, no special laws were for a long time deemed necessary for the encouragement of discovery. Such an occupation as prospecting was not known or else it was regarded as a process requiring the exercise of scientific ability, and the expenditure of considerable money. In all these countries there has never been, until very recently, a middle class. Society has been divided only into the upper class, who did no manual labor, and the lower class, who did nothing else. The first would not prospect even if the idea had occurred to them, and the second were assumed to be too ignorant and improvident to engage in such work. The discovery of new mines thus became merely a matter of accident, and has remained so ever since. Such mines as were known and had a past reputation for productiveness, but had been abandoned for one reason or another—generally because permanent water level had been reached, and its control was beyond the capacity of the crude appliances of the day—lay neglected for generations, until foreigners, attracted by legends more or less reliable as to their past history, succeeded in interesting outside capital in their rehabilitation. The Latin American is not himself a miner by temperament, and is rarely willing to risk his money in ventures of this kind. But he is always ready to sell. In this way many of the famous mines of old passed into the possession of aliens.

As this process advanced, and the industry began to revive somewhat, the necessity arose for legislation of the kind that defined more clearly the relations of capitalists and corporations to the State, and accordingly new codes were enacted in most of the South and Central American republics. Abstracts of most of these follow. In all of them, except Argentina, where the occupation of prospecting is referred to at all—as it generally is—it is declared to be free and open to any citizen or alien. But the regulations prescribed are of such a nature that few if any of the class that would do prospecting work can comply with them, or

would do so if they could. Thus in Argentina, for example, whose code in this respect, however, is not quite typical, application for prospecting rights must be made in writing, the applicant must state the area he desires to search over, and the metal or metals he hopes to find. The region asked for cannot exceed 1250 acres, and the time granted for the search must not be over 300 days. If the permit is granted, and the location proves to be upon land already alienated, and the owner objects to the exploration, the applicant must go before a Court of record and submit his request to a public hearing. If this results in his favor the area must be advertised for a stated period, and a bond given to protect the surface owner from any damage that might result from the excavations about to be made. In Bolivia, in addition, the Court sends an expert—at the expense of the applicant—to look over the ground, and decide whether it is worth prospecting, after which it is still wholly within the power of the authorities to refuse the permit. But if it is granted, only 30 days are allowed for the search. In Peru, after obtaining the permit, a shaft 30 feet deep must be sunk, and submitted to the inspection of an official of the Mines Department, who has the arbitrary power to refuse further permission to operate if, in his opinion, the chances of developing a paying mine are poor. Naturally little prospecting (as we understand the occupation) will be undertaken under such conditions, and when laws are so framed it is clear either that it was not intended to provide for that line of activity, or that no proper conception of the necessity of such preliminary exploratory work existed in the minds of the legislatures who enacted them.

In Mexico and Chile, however, all such restrictions are removed, and yet the business of prospecting is unknown. Why this is so will perhaps be made clear in the chapter on that subject.

Throughout Latin America the principle holds firm that no fee simple title is obtainable for mineral land. Possessory rights, subject to an annual tax is the only form of title given. This annual tax is generally quite reasonable, and often is payable in

two or more installments, but it cannot be paid in labor, which is the only kind of currency the working class possesses. Hence, even in Mexico, very few laboring men become mine owners.

No extralateral rights are allowed anywhere under the Latin systems, but a most interesting attempt to convey such privileges to a limited extent has been inherited from the old Spanish laws, and has been incorporated in the Peruvian law. Details of this are given in the chapter on "Extralateral Rights."

In all respects the laws of these countries are apparently favorable to company operations. Concessions are liberally granted, and as long as the very reasonable annual taxes are paid, and no revolutions occur, holders of such rights are assured of great security. The general laws and the church keep labor well in control, and experience has shown that the working people of these countries, when fairly treated, are faithful and can be trained to a moderate degree of efficiency. They make excellent miners, and quite a proportion become capable of handling machinery under ordinary circumstances. But universally they fail in emergencies, when initiative is demanded. This is undoubtedly due, not to any lack of intelligence or courage, but to a lack of education. So long as a people do not know the causes of the simple phenomena of every day life, and are taught that they must look to others for explanations of such matters, so long will they remain incapable of giving anything more efficient than faithful routine service in return for wages.

In Mexico, where the Latin system has attained its highest development, the mining laws, so far as they touch the relations between the State and mining corporations or individual mining operators, are exceedingly satisfactory. Mining engineers, company managers and agents universally approve them. The proportion of gross output claimed by the State in the form of taxes or royalties or both is not unreasonable. The protection granted in return is ample so long as the authorities retain control of the population. Few regulatory systems work as well when they work at all. But in all lands so conducted, on the basis of a large submerged, uneducated, and supposedly inferior working

class, with no middle class into which they may hope to elevate themselves, and through it voice their aspirations to the upper and governing class, rebellion and anarchy sooner or later come, destroying the improvements and wiping out the profits of the years of quietude. To the Anglo-Saxon, operating for himself or others in such lands, the problem is to keep looking ahead for the time of the inevitable storm, and well before its arrival to clean up if possible and get away; to do the latter, anyway.

It would be taking a backward step to look to such lands for ideas in law that might be advantageously applied to modern industrial conditions in forward-looking nations. The conceptions of human rights current there are those of regimes that have already had their day.

ARGENTINA

(Law of November 25th, 1886, with amendments to date of January 1st, 1917)

For the purposes of the law mines are divided into three classes, as follows:

Class 1.—Those which exist under the surface soil, in rock in place, to wit: ores of the metals, combustibles, and precious stones in veins. These are open for appropriation under the law.

Class 2.—Those which occur on or in the surface soil, or, if extending below it into the bedrock, yield well known materials of common use. Included in this category are metalliferous alluvial deposits, abandoned mine and furnace dumps, and tailings from mills, borax, saltpeter, marl, peat, pyritiferous and aluminous earth, magnesite, fuller's earth, emery, ochre, fossil gums, soapstone and whetstone, phosphates, sulphur, barite, fluorspar, copperas, graphite, potters clay, and salines. These, when found upon the public domain, may also be appropriated under the law. When occurring on alienated land they belong preferentially to the owners thereof, but are open to appropriation by others with his consent, which under certain circum-

stances may be forced, under the theory of eminent domain, if considered for the public good.

Class 3.—Building stone, brick clay, sand, cement rock and similar materials. The land upon which these substances are found may be purchased from the government in the ordinary way if still unoccupied, but when upon alienated land belong exclusively to the surface owner, and cannot be appropriated without his consent.

As to other substances not above mentioned, either omitted accidentally or because they have become known or desirable only recently, the rule for classification will be based upon their nature and importance. The same rule will apply to the substance classified, which sometimes, by reason of the discovery of new uses, should be transferred from one class to another.

Mines that are open for appropriation are held to be the property of the Nation, whether situated upon public or upon private land.

The right of searching for, owning, using, and selling such deposits is conceded to all individuals who can legally own property of any kind, but only in accordance with the provisions of the law. The Nation is not empowered to work or sell mining property, but it can grant the provisional possession and usage of such real estate so long as the conditions for tenancy and operation are complied with. Mines constitute a class of property distinct from the surface, and may be transferred from one holder to another by substantially the same procedures as in the case of ordinary real estate.

Prospecting is not free. A permit is required, both from the government, and from the soil owner when it is desired to explore on alienated land. But in neither case does the permit cost anything. To secure exclusive exploring rights on a selected area a written application must be made to the local authorities giving a description of the tract desired, the metal or mineral to be sought, and the name and address of the surface owner if the tract is not on the public domain. After public advertisement of the application, and other formalities that may take 30

days or more for their execution, the permit may be granted. It may also be denied if the surface owner can show good cause for refusal. If granted, the area so securable is 500 hectares (about 1250 acres) for one individual and 1000 hectares for two or more if the land is cultivated or fenced, or 2000 hectares if on the public domain. The tract must be a solid body, and in as compact and regular a form as possible. The term cannot exceed 300 days. Active work must begin within 30 days, and must be continuous thereafter. If within the term the prospector makes a discovery and desires to inaugurate serious development work, he may locate three claims, contiguous or separate, and within five months thereafter must apply for the formal grant of the same. Meantime he cannot turn into money in any way any substances found, but must store them upon the premises until the grant issues. Also, before the latter will be issued to him he must pay the surface owner (if any) for all damage that may have resulted from his prospecting operations, and may be required to give security for what may be done in the future.

The unit lode mining claim is a parallelogram measuring 300 meters in length, which dimension must be laid off along the apparent strike of the ore body. When the latter dips vertically or nearly so into the earth, the width allowed is 200 meters. When the dip is greater than 45 degrees from the vertical and not over 50 degrees, the width can be 245 meters. Between 50 and 70 degrees a width of 250 meters can be taken. From 70 to 75 degrees, 275 meters. If over 75 degrees, 300 meters. The discovery point may be anywhere within the boundaries. For an ordinary alluvial claim, 100,000 square meters (about 21 acres). For dumps, slag heaps and tailings, 70,000 square meters (about 15 acres). For rock salt and peat, 20 hectares (about 50 acres). For pyritous, aluminous or Fuller's earth, copperas, magnesite, emery, ochres, ferruginous clays, fossil gums, soapstone and whetstone, phosphates, chalk, sulphur, baryta, fluorspar, graphite, kaolin, soda and potash salts, 70,000 square meters.

For iron mines, two unit lode mining claims, or 120,000 square

meters (about 25 acres), but if grouped, up to 240,000 square meters (about 50 acres) may be taken.

For coal, oil, gas, asphalt and other combustibles, three unit lode claims, or 180,000 square meters (about 40 acres), but when grouped, up to 540,000 square meters (about 120 acres) are allowed.

The discovery of ore is not necessary in the case of a lode claim located upon the dip of a vein, where the outcrop is already located.

In the case of all mining claims located on alienated land, no surface rights exist. The claimant must arrange with the soil owner for what surface he needs. But the claimant has the right to demand the sale or lease of the surface to the extent of one unit lode claim, and on equitable terms.

All claims of all kinds must be registered within 30 days after the grant allowing them has been issued.

Metalliferous alluvials and gravels containing precious stones or any other desirable mineral (like monazite, for instance), abandoned mine dumps, slag piles and tailing beds, when on alienated land, cannot be located; but when existing on the public domain may be worked by anyone without permit or the necessity of filing claims, so long as the operations are of a primitive character, and do not involve the installation of machinery.

The procedure for acquiring title to mining claims is substantially the same for all kinds of claims, and may be summarized as follows:

The ground is first staked provisionally, a post being erected at each corner and at the discovery point. Within 100 days thereafter the discoverer or his legal representative must present himself at the office of the nearest chief local authority and fill out a written application in duplicate for the ground. This document must contain a very clear statement as to the situation of the claim, its area, the name and legal residence of the owner of the land on which it lies (if it is not on the public domain), the names of neighboring mines and their owners, and, of course, his own name and those of his partners if he has any. A sample of

the mineral found must accompany the application. When it is finally signed, one of the copies is then returned to the claimant with the endorsement on it of the date upon which it was presented; while the other, also similarly dated, is forwarded to the Chief of the Department of Mines in the capital of the State in which the claim is situated. There, after examination, the document is approved, or denied for cause, or returned for further information or possibly for some correction. If approved and when finally in order, it is advertised for 15 days in the local paper if any exists; if not, then by posting on the door of the chief local Authority, and by handbills, for the same term. If no adverses are filed during the period, the claim is registered.

Within 100 days after registration the claimant must do enough work upon his vein or deposit to disclose its general direction along the surface and its dip to the depth of at least 10 meters. If this term is not long enough it will be extended. Twenty days after the expiration of the term or its extension the claimant must apply for the official survey, and deposit the cost of the same. Within 20 days after its completion the claimant must erect substantial monuments of stone at all corners as given by the government engineer.

Upon a vein already known only one claim may be located by an individual. But the discoverer of a new vein is allowed to locate two claims upon it, and if he is acting for a company or has a partner, he may take three, contiguous or separate. Such a "new" vein however must be situated not less than five kilometers from the nearest registered mining property.

Upon all registered claims not less than 230 shifts of labor must be performed annually. Anyone who can prove that such an amount of work has not been done acquires the legal right to "denounce" and become the owner of the claim.

Mining claims have no extralateral rights. But if a miner has pursued his vein to his side line and it is carrying ore at that place, he may locate the adjoining ground by virtue of the discovery so made, if it is open for location. Or, if it is occupied already by another he is at liberty to follow his vein into the

adjoining claim and extract ore from it until a connection is made with the workings of the neighbor. But before so trespassing he is under legal obligations to advise the neighbor of the intention, and as soon as connection is made, either by himself or the neighbor, he must cease work and retire within his own lines. All ore taken out during the period of trespass must be disposed of separately, and the proceeds, after the costs of production and treatment are deducted, are divided equally between the adjoining owners.

A mining claim once allowed and registered conveys all the minerals within its lines except those of the third class. These, if produced, must be turned over to the surface owner (if any) who must pay for the cost of production.

Surface owners may work any mineral deposit discovered on their premises by themselves or their servants or employees, without any authority from the government, and without locating any claims. But, if they do so, they lose all rights against other discoverers and locators.

Discoverers of valuable deposits of substances of the second class on alienated land may locate claims thereon, but cannot demand surface rights from owners thereof. If the latter insist on taking possession of such claims—as they have the right to do—the discoverer must be properly indemnified for his time and outlay.

Surface owners cannot demand or collect indemnification for unoccupied land upon which waste from mine operations, slag from furnace operations, or tailings from mill operations are deposited by present day operators.

Mining claims of all kinds are accorded the legal standing of landed property (real estate), and may be transferred in the same ways. If the transfer occurs before registration, the conveyance must be of a public nature, and be advertised in a newspaper, or by posting, or by handbills. But after registration the transaction is of a private nature, and calls only for the recording of the deed of conveyance.

Exclusive rights for dredging and hydraulic operations are

obtainable, and groups of alluvial areas may be consolidated for such purposes. But before initiation work 2% of the capital raised must be deposited in the National Bank of the Republic as a guarantee that adequate machinery will be provided. This is returnable as soon as operation begins, which must occur within 300 days of authorization.

BOLIVIA

(Law of November 28th, 1906, with amendments to January 1st, 1917)

All deposits of the metals and precious stones, also of borates, nitrates, iodine, sulphur, coal, mineral oil and gas, peat, asphalt, fossil gums, alum, and other substances of industrial use, are the exclusive property of the State, whether existing upon the public domain or on privately owned property. Limestone, sand, gypsum, building stone, and clay when existing upon alienated land are the property of its owner. If on public land such substances may be made use of by anyone, without government permit or liability for taxation.

The distinction, from a legal point of view, between surface and underground realty is strongly emphasized in this law. The former is defined as the surface proper, together with such a thickness or depth of soil or other material underneath it as may be necessary for all kinds of activities except that of mining. What is below this varying boundary or frontier is the underground. The title to this must forever remain in the name of the State, but the use of it for mining purposes can become the subject of a grant, subject to the prescriptions of the mining law. When the surface as above defined contains any mineral substance of use or value—excepting the few just listed above—mining grants may also be issued by the State for the recovery of the same, even though the area has been alienated, unless covered with buildings, orchards, enclosed gardens or public parks. Other fenced areas in crops are also exempted unless the permission of the owner is obtained. But when it is refused the government reserves the right to permit mining operations upon or

under them when proper cause is shown for doing so, and when adequate security is given for damages that may result. Further, in such cases, expropriation may be insisted upon if it appears advisable and for the public welfare.

Prospecting is free to all, but the prospector is under obligations to give notice of his intentions to explore where the locality to be searched is on alienated land, and on such tracts his operations must be limited to excavations not over 10 meters in length or depth. When prospecting under a special permit on cultivated land the operations must be concluded within a term of 30 days, which cannot be extended.

The unit mining area is the hectare, a square of 100 meters on each side. Any number of these, when grouped as a solid block, may be applied for as a mining location or claim in a well-known mining district, but in a newly discovered district the limit is 30 hectares. Distinct discovery of mineral values of some kind is a necessary prerequisite to the initiation of a mining title. One having been made, the discoverer at once makes application for it in writing, either in person or by attorney, before the Prefect of the Department in which it is situated. This formal petition must be made in duplicate, on stamped paper purchasable from the Prefect, must give all information ordinarily called for in such a document and must be accompanied with a representative sample of the mineral found and a deposit of cash sufficient to cover the costs of the application, which are reasonable in all details. Priority of application is considered prima facie evidence of priority of discovery unless fraud can be shown.

Upon receipt of the application it is dated and signed by the Prefect and all interested parties, the duplicate handed to the claimant and the original forwarded within three days to the editor of the official government Bulletin at the capital for publication during a term of 70 days. Also in a local paper—if any—to the extent of at least three insertions at intervals of not over 10 days. During this publication period all objections to the issue of the grant must be formally filed with the Prefect. If none appear the claim is officially surveyed, monumented, and

registered, and the claimant after paying the first year's taxes and all unsettled charges is put into physical possession.

Tunnel claims for drainage, discovery, ventilation or transportation may be secured by the same procedure, but in this case no discovery is required. If the proposed tunnel is intended to cross under and through any existing grants the permission of the owners thereof must be secured in writing, and a copy of an agreement with them relating to the disposition of any ore encountered during the traverse of their ground be deposited with the authorities.

Concessions for operating metalliferous alluvial deposits, abandoned dumps and slag piles, or any valuable mineral occurrence on or in the surface soil, are granted under the same general conditions and with the same general procedure as for under-surface properties.

A mining concession once allowed is of the nature of a lease in perpetuity, dependent for its maintenance only upon the payment of the annual tax, and the reasonable observance of such regulations as the law prescribes for the protection of the life and limb of employees, and to secure proper sanitary conditions. The government exercises no surveillance of any kind over the technical operations at the mine, but holds the operator legally responsible for the annual tax until he formally gives notice of his intention to abandon.

The annual tax on under-surface metalliferous mines is four bolivianos per hectare of surface in the property; on metalliferous placers two bolivianos per hectare; on non-metalliferous minerals like baryta, fluorspar, borax, etc., one boliviano; on combustibles, 50 centavos per hectare, and on abandoned dumps and slag piles, nothing at all. These several imposts are payable semi-annually in advance on January 1st and July 1st. If not paid within 30 days after these dates interest at the rate of 9% per annum attaches. If not paid within a year plus 15 days forfeiture and eviction automatically ensue.*

* Under normal conditions the boliviano is worth about 40 cents U. S. gold.

When the document of a concession is delivered an impost of one boliviano per hectare of surface is payable. This is to defray the cost connected with entering up the property on the official map of the mining district in which it lies.

Duties are levied on all metals or metallic ores exported. The rates vary with the degree of refinement of the product, and the market price of the metal or metals it contains.

When litigation occurs on the question of the ownership of a mining property, the courts are prohibited from ordering the suspension of mining work for any cause during the progress of the suit. Instead they are clothed with the power to take possession and continue operations under the management of a court receiver until the matters at issue are settled.

The miner owns everything beneath the surface soil within vertical planes passing through his boundary lines. Trespass beyond these planes to the extent of 10 meters may be punished, when proven, as common robbery.

All surface mining rights on privately owned property must be arranged with the soil owner if possible. If not, expropriation can be demanded by the miner in the courts to the extent that he can show is necessary for the proper working of the ground. Mining companies and individual operators are held strictly accountable for the lives and health of employees of all grades.

Surveying, advertising, and registration charges and fees of all kinds connected with the acquisition and maintenance of title are reasonable. No royalties of any kind are collected by the government, or can be demanded by surface owners.

BRAZIL

(Legislative Decree of January 6th, 1915. In effect January 1st, 1917)

For the purposes of the Law all organic or inorganic minerals existing upon, in, or underneath the surface are classified as *Mines* or *Non-mines*, as follows:

Mines.—Metals, or minerals from which metals may be extracted (except iron), mineral oil, coal, asphalt or other combustibles, graphite, sulphur and gem stones in veins in rock.

Non-mines.—

Class 1.—Iron ore, salines, nitrates, building stones, sand, asbestos, clay, ochres, mica, peat, phosphates and mineral waters.

Class 2.—Alluvial deposits containing metals or gems.

Class 3.—Quarries.

When deposits of substances are found which are not mentioned in any of these divisions, it is the duty of the "Superior Council of Mines" to classify them.

Mines belong either to the Republic, the States of the Republic, or to the surface owner, if any. In the first two cases if claims are located upon them and titles thereto solicited and acquired from the proper authorities, such titles convey only underground rights, and such surface rights as may be required for the operation must be obtained in another and the ordinary way.

Non-mines, when existing on alienated areas, belong to the surface owners of such areas. When upon the public domain (unoccupied Federal or State land), they may be acquired by purchase of the surface in the ordinary way.

Surface owners may prospect their ground and work any deposits found therein without any authorization from the government, but their operations must be conducted in conformity with the general laws relating to the safety of employees and to sanitation. Prospecting on alienated land is not allowed without the consent of the owner, and when consent is given the terms and conditions are matters of agreement between prospector and owner.

The business of prospecting in the eyes of the law not only consists in looking over a given area and noting outcrops or other mineral indications thereon, but includes the development of the same by shafts and levels, and the sinking of drill holes.

When a surface owner refuses to allow prospecting on his land, the law provides means by which he may be compelled to permit it, or by which the area desired may be expropriated. No prospecting license is required for prospecting on alienated land.

But prior to prospecting—other than "looking over"—on the public domain, a petition must be made to the Minister of

Agriculture, through the Geological Survey Bureau, in which the locality it is desired to explore is specifically located and described. When this is done it is obligatory upon the Minister to grant the license free of charge, and within 30 days from date of application. Such licenses are good for a year, with the privilege of a year's extension on proper showing by the holder that more time is necessary. The license grants the right to stake off an area the size of which—within certain limits hereafter given—is a matter of agreement between the prospector and the minister, but may not exceed 100 hectares (about 250 acres), nor be less than five hectares (about 12½ acres), excepting in the case of river bed alluvials, when the amount allowed may be as much as 50 kilometers (about 31 miles) of the stream. Such licenses are non-transferable, excepting with the permission of the Minister.

The unit mining claim is five hectares. The maximum number of these that may be staked off and applied for as a mining grant by an individual for gem stones and the rare metals (gold, silver and platinum) is ten, or a tract of 50 hectares, and for all other substances 20, or 100 hectares. But in the case of a company the permissible area is doubled.

The maximum term for such grants for either an individual or a company is 30 years. But at its end this term may be extended at the discretion of the government. Such grants are not transferable except with the consent of the authorities, but they may pass to one living heir, one living spouse or one living partner.

When the grant is an alluvial one, and is located upon a public Federal river, the maximum size is 50 hectares (about 125 acres) for an individual, and 100 hectares for a company.

These grants, once given, carry the exclusive right to the ownership of all minerals that may be found in them during its term, regardless of whether they are mentioned in the grant or not; but upon the grantee rests the obligation to advise the authorities of all new discoveries.

A discoverer who has secured a mining grant, and does not

wish to work it, or is not able to, and desires to transfer his rights to a party willing and able to operate in accordance with the requirements of the law, may do so, and in consideration may claim the reimbursement of his prospecting expenses to date of transfer, and also, at his option, a lump sum in cash, or an annual payment up to 2% of the net profits.

All mining grants carry the obligation to begin development work in earnest within one year of their date, and to continue the same with reasonable diligence during their term.

They also carry the obligation to pay annually to the Government a rental, which is agreed upon when the grant is issued, but which cannot exceed 150 milreis (about 15 cents) per five hectares (or fraction thereof) of the total area;* and in addition a royalty, which is also a matter of agreement, but may not be over 6% of the net profits. However, neither of these imposts become payable until two years of the term have elapsed, which two years are free.

CHILE

(Law of December 20th, 1888, in force January 1st, 1917)

The State claims exclusive ownership and control of all mineral substances existing upon, in, or under the surface soil, and whether on public or private land, except as to coal and other combustibles which, when occurring on alienated land, belong to the owner of the surface, but must be worked in accordance with the provisions of the law.

Prospecting is free. No license is required.

Discovery of mineral is a necessary pre-requisite to the filing of a claim.

Mining claims may be located on any unoccupied land, and carry with them the exclusive right to utilize the surface within their lines for all necessary mining purposes, as well as exclusive underground rights, so long as the provisions of the law are complied with. But when it is desired to locate upon alienated land,

* Equivalent to about 1¼¢ per acre.

the owner thereof must first be secured from any damage that might result from the miner's operations.

Possession is maintained by an annual tax per hectare (about 2½ acres) of area.

Not more than three mining properties can be located upon the same lode or vein, but any desired number may be acquired by purchase.

The party who first reports a new discovery is considered the proper claimant, unless fraud is proven.

The act of registration consists of an appearance before the local judge, either personally or by agent, to whom all particulars of the find are reported, and a sample of the ore is given. If the discovery has been made in a new mining area, that is, one distant five kilometers (about 3⅛ miles) or more from any previous discovery, the finder thereby acquires the exclusive right, for the next 50 days, of locating a total of three mining properties on the same vein or deposit. But if the find is within five kilometers of mines already known, he may locate but one mining property on the vein.

Within 90 days after reporting the discovery (which is the act of registration) a shaft at least five meters deep must be sunk on the ore.

The unit mining area is the hectare (about 2½ acres), measuring 100 meters (about 300 ft.) on all four sides, and rectangular in shape. No more than five of these, laid out contiguously in a block, nor less than one, may constitute a mining claim or property, on veins or deposits of the metals; but for coal, salt, salines, oil and other economic minerals, up to 50 may be taken as a claim.

After the shaft is sunk to the required depth, monuments or stakes must be erected at all corners, and before the expiration of the 90-days term the claimant must appear before the district Judge and ask for an official survey, at his own expense. When this is made, and the corner stakes correctly set, the claimant is formally placed in possession, and his title becomes incontestible, except by the State for failure to pay the annual tax, or to operate

in accordance with the provisions of the law. After survey and final demarkation, conveyancing rights are complete.

The annual tax is $10 per hectare or fraction thereof on metal mines, and $5 per hectare on all others.* But if the mine owner in the first case happens also to be the surface owner, the annual tax is only $5 on metal claims. These taxes are due in advance, and must be paid sometime in the month of March. If not paid, the property is sold at auction, and all money received over the amount due the government and the costs of sale, is returned to the former owner. If there are no bidders, or if the highest bid is less than the amounts due, the ground is declared open to location by anyone.

COLOMBIA AND PANAMA

(Law of January 1st, 1868, with amendments to January 1st, 1917)

The mineral resources of the country are owned as follows: The Nation is the owner of precious stones and of rock salt, whether occurring on the public domain or on privately owned land. The various States of the Republic own all deposits of the precious and base metals that occur within their boundaries, also all other desirable mineral substances, when existing upon unoccupied land; but when upon alienated land the latter are the property of the owners thereof.

The Federal government will not grant to individuals the right to search for or work deposits of precious stones or rock salt, but will consider propositions from companies incorporated under the laws of the Republic, and sufficiently capitalized. For all other mineral substances existing upon unoccupied land, application must be made to the Governors of the States.

Prospecting is free. The maximum size of the unit mining claim for veins and lodes and for any other kind of ore deposit in rock in place is 600 meters in length by 240 meters in width (about 1800 × 720 ft.), and contains therefore about 30 acres.

*Under normal conditions the Chilean dollar is worth about 40 cents in U. S. gold.

The alluvial, dredging, and hydraulic claim unit is a square measuring three kilometers on each side, or a rectangle measuring two kilometers by five kilometers (about 2470 acres).

In staking off lode claims the measurements must be made upon the surface of the ground, and not upon a horizontal plane.

The legal holder of a mining claim of any kind has exclusive possession and usage of the surface within his lines, and of all substances found vertically below the area so enclosed. No extralateral rights are recognized.

The discoverer of an entirely new lode has the right to locate three contiguous claims upon it. In all other cases only one unit claim may be taken by an individual on any one lode.

The process of acquiring a title to a lode claim consists first in erecting a post or monument at the place of discovery, upon which a notice is posted giving the name of the locator, the date of discovery, the name to be given to the claim, and an approximately correct statement of the position of the corners with regard to the discovery point. Immediately thereafter the claimant, either personally or by a duly authorized representative, appears before the chief local authority of the district—commonly called the Jefe Municipal—and formally applies for the claim. To this official must be given all the items of information above enumerated, together with such a description of the surroundings as will serve to identify the claim with certainty. All this is entered in a book in the Jefe's office, and signed by the claimant, who at the same time deposits a recording fee of 50 cents. Two copies are made of this document, one of which is given to the claimant, while the other is at once dispatched to the State authorities.

The locator then proceeds to stake or monument his claim carefully, and in due time receives a notice from the Jefe that his application has been either allowed or refused, according to whether the State authorities find the ground is open for location of claims or not. If it is allowed, he must pay a title fee amounting to $4 for a gold or silver claim, or $2 for a base-metal claim. If it is a platinum claim the fee is $25. When these charges are

paid the Jefe personally or by deputy places the claimant in physical possession of the ground. Thereafter the title is maintained by reasonable working conditions, and by the payment of an annual tax of $1 per unit claim or fraction thereof.

COSTA RICA

All desirable mineral substances, whether existing in the surface soil or in the underlying rock, or whether found on the public domain or on privately owned land, are under the exclusive control of the government as State property, and may only be worked under the provisions of the mining law.

Prospecting is free on the public domain and upon all unoccupied alienated land. When the latter is in crops, or covered with buildings or other surface improvements, the consent of the owner must be obtained, if possible, before explorations are begun. If it cannot be freely secured the matter may be brought to the attention of the authorities, who will enforce the rights of the prospector and miner to the extent which, under the circumstances seem to be warranted. Soil owners may not claim any rights on minerals discovered by others on or under their property, but may do so by virtue of discoveries made by themselves or at their expense. They must be equitably compensated for all surface used by explorers, either through rental or purchase, and for all damages resulting from their operations.

The unit area for mining claims is a horizontal rectangle measuring about 275 feet in length along the assumed line of outcrop of the vein or deposit by about 550 feet across it, and conveys no extralateral rights. The discoverer of a new mining field may locate three such claims, adjoining or separated, along the line of the main vein found, but when they are separated the distances between them must be not less than 275 feet or accurate multiples of that figure, so as to permit of the location of full length intermediate claims. He may also locate one such claim upon each minor or secondary vein found by him in such a new field. In an old field only two such claims may be taken up by

any one explorer, but he may secure as many others as he desires by purchase.

Application for territory located is made before the Judge of the local court in person or by attorney, and after due advertisement and a public hearing if necessary, if no adverses are filed or sustained the claimant is given temporary possession for sixty days, during which period he is expected to sink a shaft at least 30 feet in depth. An extension of this time will be given for good cause shown. When the prescribed work is done the premises are examined by the government engineer, and if the developments are approved by him a survey is made (upon deposition of its cost by the claimant), the location of all corners indicated by temporary stakes and his report—accompanied with two copies of his map—filed with the authorities. Thereafter, as soon as the authorities are formally notified that permanent monuments have been erected at all corners indicated by the engineer, a Certificate of Possession is made out, and after a final inspection of the premises by the engineer the same is delivered if he reports that everything is in order.

The title so granted is of the nature of a lease in perpetuity, depending for its maintenance upon reasonably continuous and energetic mining operations. If for any cause there is complete suspension of work during the whole of a calendar year, the government reserves the right to declare the franchise forfeited.

The government makes no claim for royalties of any kind, and there are no annual taxes payable on the claims other than those due on all other forms of real estate.

CUBA

(Law of December 29th, 1868, amended in June 24th, 1871, declared valid by decree of October 10th, 1883 and June 27th, 1884. In force without change on January 1st, 1917).

For the purposes of the law all mineral substances are separated into three classes, as follows:

Class 1.—Earths, silicious rocks, slate, abrasives, building stone, limestone, gypsum, sand, marl, clay and similar substances,

when existing upon the Public Domain, may be filed upon by any one; but when upon alienated land they are considered as belonging to the owner of the surface, who may work them without liability to the State or the provisions of the law, except such as refer to the safety of the employees, and to matters of sanitation.

Class 2.—Metalliferous alluvials (placers), mineral paints, slag and scoria of old furnaces, peat, pyrite, bauxite, fluorspar, soapstone, kaolin and brick clay, if on the Public Domain, may also be filed upon by anyone. When they are found on alienated land the State reserves the right to expropriate, and allow the first claimant or applicant to own and work them, unless the surface owner is already mining them. Parties who secure such ground on alienated land must pay a tax of two pesos (about $1.00) per hectare (about 2½ acres) per annum to maintain their title. But when any of these substances are worked by the surface owner he is not called upon to pay any tax.

Class 3.—Metalliferous veins and deposits of all kinds (except pyrite), coal, mineral oil, asphalt in its various forms, salines (whether found in a solid condition or in solution as brines), copperas, sulphur and precious stones, whether on the Public Domain or on alienated land, may be filed upon and operated as mining claims, and will be granted to the first applicant in good faith.

The law recognizes two kinds of real property, viz.:

(*A*) The soil, which is understood to mean the surface, and such a thickness or depth of it as may reasonably be required for purely surface activities such as cultivation, ditches and reservoirs, buildings and their foundations, and all others distinct from that of mining.

(*B*) The subsoil, which extends downward indefinitely from where the soil ends.

The former, where not already alienated, is the Public Domain. This may be sold by the State, but for surface usage only. The latter cannot be sold, but the State reserves the right to allow mining claims to be located upon any part of it, and claims so located and approved according to the provisions of the law con-

stitute a title in perpetuity, so long as the annual mining tax is paid, and the property is operated in accordance with the provisions of the law relating to the safety of employees and matters of sanitation.

Prospecting privileges are free on the Public Domain to all individuals of legal age, whether native or foreign born; also on alienated land (excepting under buildings, fenced and cultivated areas, and public property generally, such as towns, parks, cemeteries, etc.) if the permission of the surface owner is first obtained. If refused, or unreasonable conditions are required, the law provides means to compel fair dealing. But no excavations designed as a search for mineral may exceed 10 meters (about 30 feet) in length, width, or depth in any one place, and before making such excavation notice must be given to the local authority of the intention, and the locality to be explored accurately described.

The unit mining area is the hectare (about 2½ acres), laid out as a square, with sides 100 meters (about 300 feet) long. It conveys no extralateral rights. Any number of such units—but not less than four—may be located as a mining claim, provided they adjoin on sides, and leave no vacant spaces between. No mining claims, however, may be located on substances of the first class. When located on substances of the second class they do not extend downward indefinitely, but terminate when the surface payable material ends. But when located on substances of the third class they cover all material found vertically underneath them as long as the claimant wishes to follow them into the earth.

The steps to be taken in making a location are as follows: A written application on a special blank form must be made to the local chief authority, by the claimant or his legal representative, giving all particulars, and a sample of the mineral found. Temporary corner stakes may be set up before doing this. If, on examination, the application appears to be on vacant ground, the local authority will cause it to be advertised for a period of 30 days, and if no adverse claimant appears within that term, an

official survey is ordered and monuments erected at each external corner of the group of unit claims. The advertising and survey are at the cost of the applicant. Finally, and within a period not in excess of four calendar months from the date of the application, the title will be registered upon payment of the following charges, which include the annual tax for the first year.

For a claim covering 12 hectares (about 30 acres), or less, 80 pesos (about $40).

For a claim covering over 12 hectares, and not in excess of 100 hectares, 80 pesos for the first 12, and 1½ pesos for each of the remaining ones.

For a claim covering 101 hectares and not over 500 hectares, the price for 100 hectares, plus 1¾ pesos per hectare for all above it.

For a claim covering over 500 hectares, the price for 500 hectares plus 1½ pesos per hectare for all above it.

A claim so registered is incontestable in perpetuity, so long as the annual taxes are promptly paid, and the provisions of the law relating to the safety of employees and sanitation are complied with.

Annual taxes are as follows:

For precious stones and the substances of the 3rd class (except iron), 5 pesos per hectare (about $2.50).

For iron, and substances of the 2nd class, 2 pesos (about $1.00) per hectare.

Mining claims become forfeited when the annual tax is in default for a calendar year plus 15 days. They are then sold at public auction, and all cash received at the same, less amount of taxes due plus 5%, is paid to the former owner. If after three auctions no buyers appear, the ground is declared open and free, and may be appropriated by the first applicant for it.

ECUADOR

All efforts on the part of the author to secure a copy of the mining law of this country has been futile up to date of going to press. No publication of them has been made since 1886, and the edition then printed has been exhausted for years. Although

Ecuador has within its boundaries more than 400 miles in length of the Andean range, and several places in that distance are known to be well mineralized, yet the discoveries and developments so far have not proved as attractive as those to the north in Columbia or to the south in Peru. Consequently the mining industry of the republic has never been notable, and is regarded by its citizens as of minor importance. This perhaps accounts for the indifference as to the mining laws. Such as exist have been inherited from Columbia and Peru, and consist mainly of legislative decrees placing in force the regulations and customs in effect when the country was a Spanish colony, coupled with amendments enacted hastily and without much knowledge of or regard to the needs of the industry. The result is a body of laws, scattered—like those of Brazil—through the statute books, very uncertain and confusing in detail, and often contradictory. Until this unfortunate state of affairs is rectified attempts to conduct mining operations in Ecuador will labor under many unnecessary difficulties.

GUATEMALA

(Law of June, 1908, with amendments to January 1st, 1917)

For the purposes of the law all mineral substances are divided into three classes, *viz.*, Mines, Alluvials, and Quarries.

Mines.—Veins, beds, segregations or deposits of any mineral nature occurring in rock and differing in nature from its surroundings, and carrying the metals, or such substances as sulphur, coal, nitrates, salt, spars, mineral oils and gas, asphalts, etc., belong exclusively to the State, whether occurring on public or on private land, and mining claims can be located upon them in the first case in the ordinary way (excepting as to sulphur and nitrates, where the government reserves the right to impose special conditions upon their operations). To locate upon private land the consent of the owner must first be obtained, but if this is refused, or unreasonable considerations are demanded, the law provides methods by which just terms may be secured. Mines constitute a real property, separate from the surface,

though both under certain conditions may belong to the same owner, and their transfer is effected by the usual procedures provided in the Civil Code. But in addition, a document conveying a mining title must pass through the office of the Mining Recorder of the district in which it lies. This document also passes title to buildings, machinery, apparatus, stores, animals, vehicles and all other such things found upon or properly appurtenant to the claim at the date of transfer. The holder of a mining claim must operate in accordance with the provisions of the law concerning the safety of employees and sanitation.

Alluvials.—Loose soil containing metals or minerals of value, peat, ochres, precious stones, etc., when on the surface of privately owned property, belongs exclusively to the owners thereof, who may legally refuse to grant mining rights thereon. But if the owner desires to work these himself, or lease, or sell part or all of such areas for mining purposes, he must locate claims, and thereafter must operate in accordance with the provisions of the law. When found on the public domain they are open to location by any one. Gravel deposits containing gold or other metals in the native condition, or as disseminated ores (like cassiterite), are freely open to working by any one without the filing of claims, so long as the methods of operation are of the primitive kind, as with the pan, rocker, long tom, etc. But when it is desired to treat such beds on a large scale and with mechanical appliances such as by hydraulicing or dredging, special grants may be applied for and obtained, which confer exclusive rights over large areas. Mining claims of this class that have been located on private land and worked, and then abandoned or forfeited, may be entered and denounced as if on unoccupied public domain.

Quarries.—This class includes building stones, limestone, clay, sand, marl, phosphates and other fertilizers. When existing on privately owned land they belong to the surface owner, who may not be compelled to work them or to give the right of working to others. If on public land they may be acquired by the purchase of the surface from the government, as in the case of any ordinary kind of real estate.

Prospecting is free to all individuals of legal age, whether citizens or aliens, on both public and private land, except where the latter is in crops, or is covered by buildings or enclosed, when the consent of the owner must first be obtained. If it is refused, or unreasonable compensation asked, the matter may be referred to the courts, who will issue an exclusive permit good for two months, on a circular area with a diameter of 400 meters. A longer period will be given if necessary. Proper security must be furnished as compensation for possible damage.

Other areas exempted without special permit from the Director General of Mines are the environs of a city, town, or village, the vicinity of railroad lines, canals, aqueducts, watering places, springs, and reservoirs.

The unit mining claim is a rectangular parallelogram, with a superficial area of ten hectares (about 25 acres), and so laid out that two of its sides have each a length of at least 100 meters (about 300 feet). If a discovery is made at a distance of five kilometers (about 3⅛ miles) or more from any registered mine, the discoverer is entitled to locate and stake off three such claims, but within that area only one. When a prospector has made a discovery and staked his claim upon it, his right of location upon that vein is exhausted. But he may acquire by purchase as many more claims as he may desire.

The rights acquired by a location include such use of the surface as may be necessary, but not the right to mine and utilize the loose soil thereof. The mining right begins at the surface of the solid rock underneath the surface débris, extends downward indefinitely, and is limited within vertical planes passing through the boundaries. Discovery of ore is necessary before a claim can be staked or registered.

The man who first reports a discovery to the chief official of the district (Jefe Politico) is assumed to be the discoverer and rightful owner. The application must be made personally and in writing on a blank provided for the purpose, and immediately upon its provisional acceptance the claimant must return to the premises and perform such preliminary development work as will

prove the existence of a mineral deposit at the assumed place of discovery, and enough to afford some clue as to the kind of mineral that may be expected therefrom. Fifteen days are allowed for this, and for the staking of the claim. Meantime the application is forwarded by mail to the Director General of Mines. The latter then orders an examination of the premises, and if the facts stated in the application are, in a general way, verified, the claim is provisionally allowed while public notice is being given of it either by publication for at least three times in the official newspaper of the region—if there be any—or by placards posted on the outside of the office of the Jefe Politico, which must remain displayed for at least thirty days. Within this period of public notification objection can be made to the application by any one. Also during this time enough additional development must be made by the claimant to give further data as to the nature of the deposit, the metals it will produce, and, if a vein, its angle of dip. If the find is of the nature of an alluvial deposit, or a bedded vein like coal, these details must be fairly well displayed. If the period of thirty days is not sufficient for the purpose, an extension of an equal amount will be granted by the Jefe. If all the proceedings are satisfactorily concluded, the papers and proofs are forwarded to the Minister of Public Works, who orders a survey—at the expense of the claimant—after which a Certificate of Ownership is issued to the claim holder and he is formally put in possession. This "certificate" is not of the nature of a deed, but simply grants exclusive possession and usage of the premises so long as the terms, conditions, and restriction of the law are complied with. Claims so acquired cannot be abandoned without first giving formal notice of the intention to the Director General of Mines, and paying the cost of a 30 days' advertisement in the Official Gazette.

A claim may be adjudged to have been abandoned and open for relocation by another party if for a period of six consecutive months no work by at least four laborers simultaneously has been in progress upon it; or if for a total series of 12 months out of 24 no such labor has taken place; or if during the first year of

possession and usage the openings into and throughout the mine have not been put in a safe condition. The procedures connected with the denouncement of an abandoned, deserted, or forfeited claim are substantially the same as those of locating a new one.

If a vein or deposit has been pursued to the boundaries of a claim, and the ground beyond the boundary is unoccupied, the vein owner may locate and take possession of another 10-hectare claim alongside of his own, and may follow his vein into and through it. But if the ground into which his vein passes is legally occupied, he is not only under obligations to stop at the line, but must inform his neighbor of the conditions existing.

Legally incorporated companies may acquire by location a claim of a maximum size of 60 hectares, if they or their agents are the discoverers thereof, and if the new mine is distant five kilometers or more from the nearest registered mining property; or one of 40 hectares if the discovery is within that distance, and is really on a new vein. Or if a company denounce an abandoned or forfeited claim, the new claim that it applies for may have the areas just given, according to the conditions stated. This provision does not apply to partnerships, nor to companies having less than three shareholders.

Along the land and water frontiers of the Republic there is a zone in which mining claims can be located, denounced, or purchased only by native-born Guatemalans, or naturalized citizens.

Until June 23rd, 1923, the importation of mining machinery, and of supplies not producible or obtainable in the country, is free. Also, no export duties will be levied on ores previous to that date. There are no royalties on any metallic product, nor any other kind of impost, except the annual payment of 6 pesos per 1000 pesos of valuation to the National government. A Guatemalan peso is worth about 22½c. U. S. gold. Mining property in the republic is assessed at about 40% of its true valuation.

HONDURAS AND NICARAGUA

The mining laws of these two neighboring Central American States are practically identical. That of Honduras was promulgated in 1908, and that of Nicaragua in 1906. This digest includes amendments to date of January 1st, 1917.

The Nation claims the sole and exclusive ownership of all kinds of deposits of the metals, and also of sulphur, saltpeter, precious stones and combustibles (coal, oil, gas, asphalt, etc.), regardless of whether any of these are found on the public domain or on alienated land.

Prospecting is free, and any one of legal age, whether native or foreign born, may search for minerals and locate claims thereon, except sulphur, saltpeter, and combustibles. These three are also open for mining operations, but only by special arrangement with the national Executive. The State will not sell the land in which mineral substances are found, but grants exclusive possession and right of working so long as the annual mineral tax is promptly paid in advance, and the other provisions of the law fully complied with.

All other mineral substances belong to the owner of the surface. If found on the public domain they may be appropriated and worked by any one without the formality of filing claims; or exclusive ownership in fee simple may be obtained by purchase of the surface from the government in the ordinary way, or the State will grant exclusive rights to operate on a royalty basis, without purchase of the surface.

Metalliferous alluvials found in the channels or on the banks of streams, on either public or private land, may be worked by any one without the necessity of filing claims, so long as the operations are of a primitive nature, and so long as no injury is inflicted upon surface owners. Or, exclusive rights may be obtained by filing claims. The latter procedure is required in operations involving the use of machinery, such as dredgers and hydraulic plants.

Mine dumps, tailings deposits, and slag piles belong to the properties from whose ores they were derived. But as soon as

such mines or furnaces are legally forfeited or abandoned their waste deposits are open for location by anyone.

When privately owned land is fenced or under cultivation, or covered with buildings, reservoirs, or any other artificial structure, the permission of the owner must be obtained before it can be prospected. If permission is refused, the matter can be referred to the local Judge, whose decision is final; if granted, the time allowed cannot exceed 70 days, and the prospector must give security for any damage that may result.

The unit mining claim is the hectare (about 2½ acres). Any number of these up to five may be taken as a "claim" or "location." The discoverer of a new vein distant four kilometers (about 2½ miles) or more from any other registered mine may locate three claims upon it, together or separate, and he has exclusive rights for a term of 50 days to make his selections. Only one claim can be located by other parties on this vein or upon any vein of which they are not the original discoverers, but any number may be acquired by purchase.

The procedure for acquiring title is as follows: The discoverer, either personally or by a duly authorized representative, appears before the nearest local authority (generally the Jefe Politico) or Judge, and announces his discovery, describing the locality and surroundings carefully, giving his name, those of his partners (if any), the name to be given to the mine, and presenting a sample of the mineral found. This information is at once recorded in a special book, and is dated and signed by the discoverer or his agent, and a certificate to that effect is given by the recorder to the claimant. The latter then returns to his claim and within 90 days is expected to sink a shaft at least eight meters (about 25 feet) in depth, and to do any other work that may be necessary to display clearly the course of the vein, its probable angle of dip, its thickness, and the character of ore it carries. Also in the same period he must lay off his claim provisionally, setting temporary stakes at all corners and at the discovery point. If a longer term than 90 days is required for the completion of these details it will be granted on application.

While he is doing these things his preliminary declaration is being published, three times at ten-day intervals in the local newspaper, if any; if not, the advertising is accomplished with handbills, and by posting on the doors of the Court House. The papers then go to the Judge of the District Court. At the end of the 90-day period—or its extension—the claimant must appear again in person or by attorney before the local Judge, and apply for an official survey, and deposit the estimated cost of the same. This will be made by a government surveyor, who, in the presence of the claimants and as many of the neighboring owners as will come, and two witnesses, lays off the ground by deciding first upon the width allowable. This dimension is based upon the dip of the vein, as follows: If the dip—from the horizontal—is 65 to 90 degrees, the width cannot exceed 100 meters (about 300 ft.).

If from 60 to 65 degrees.....	115 meters (about 350 ft.)
If from 50 to 60 degrees.....	135 meters (about 400 ft.)
If from 45 to 60 degrees.....	165 meters (about 500 ft.)
If from 30 to 45 degrees.....	200 meters (about 600 ft.)

The length, taken along the line of strike, will be such a measure as, multiplied by the width as determined by the surveyor, will give the claimant the number of hectares he desires to take. All corners are indicated by the surveyor, whose formal report and map go to the local Judge and are registered. A copy of this second record goes to the claimant and constitutes his title. The latter must immediately erect substantial monuments at all corners indicated by the surveyor, and maintain them in good order continuously.

Titles are maintained in force, first, by the payment of an annual tax of 5 pesos (about $2.50) per hectare, due during the month of January; and second, by work on the property. Legally this labor must be continuous, and by not less than four men, excepting on holidays; but this regulation of the law is interpreted with great liberality by the authorities, so that any claimholder who is reasonably energetic in his operations will not be interfered with by them.

A mining claim in good standing carries all the minerals found in it, and conveyancing rights are complete after final registration. All transfers made before that must be advertised.

In the case of alluvial claims the dimensions allowed are what the claimant finds necessary to cover the ground he desires, up to a total of five hectares (about 12½ acres). The law makes satisfactory provisions for tunnel rights for drainage, discovery and working purposes, grants rights of way through mining claims, and compels owners of mines drained to contribute to its maintenance.

Companies or partnerships who desire to secure exclusive prospecting rights over large areas outside of established mineral districts, may do so to the extent of 2000 hectares (about 5000 acres) at an annual cost of 50 centavos (about 25 cents) per hectare (20 centavos in Nicaragua). Such a concession carries underground rights only. Within the limits of the grant, and within the term of six months (one year in Nicaragua), a tract not to exceed 200 hectares (100 in Nicaragua) may be selected for surface usage, and used as a mining claim as long as desired by the payment annually in advance of the tax of two pesos (about $1.00) per hectare of such surface, coupled with compliance with the other terms of the concession as the same have been agreed upon, which vary in each case with the conditions and circumstances of the grant.

There is an export duty of 5% on gold and silver, but not on any other metal or substance.

Imports of mining and ore-reduction machinery, and mining, milling, and smelting supplies of all kinds are free of duty.

MEXICO

(Act of 1892, with amendments to January 1st, 1917)

The mineral substances placed under the provisions of this law are of two classes, to wit:

A. The metals, except certain metallic oxides known as mineral paints, and also excepting alluvial tin deposits.

B. Precious stones, rock salt and sulphur.

To acquire the right to work deposits of these, which, wherever found are regarded as the property of the Republic, regardless of whether the surface rights have been alienated or not, claims must be located and registered in accordance with certain formalities.

Mineral fuel and oil, asphalt, natural gas, building stone, clay and earthy substances of all kinds, if found on territory the surface rights of which have passed from the government to individuals or corporations, may be freely worked by the latter (unless already applied for by another party), without the necessity of filing claims upon them, but must be operated in accordance with all the other provisions of the law. If other parties than the surface owners discover and desire to operate deposits so located, they must not only file claims upon them, but must obtain the consent of the surface owner. If an equitable arrangement cannot be effected by direct negotiations with the owner, the law provides for the condemnation of the land through proceedings in the Court of First Instance of the locality.

Prospecting is free to all inhabitants of the Republic on the Public Domain, and also on lands the surface rights of which have been alienated. But, excepting in the case of drill holes, excavations of a greater depth or length than 10 meters (about 30 feet) are prohibited on privately owned land, before the location and recording of a claim.

Upon a discovery being made on privately owned land, or at the inception of operations thereon which are expected by the explorer to result in a discovery, a notice must be posted on the premises, and a copy of it filed with the local representative of the Department of Fomento, in which the name of the applicant, the date of the posting of the notice on the ground, and the size of the claim desired shall be mentioned. When this is done the claimant acquires the exclusive right, for three calendar months, to carry on exploratory work on the premises so described.

The unit mining claim on the surface is a horizontal square, measuring 100 meters on each side, and containing therefore

about 2½ acres. Any number of such units may be located, either compacted in a group, or separately.

Immediately after indication of the bounding lines on the surface by suitable monuments at the corners, application for registration is required. A survey of the premises by a government engineer, and a publication in the nearest paper follow. If, during the prescribed period of the latter no adverse claim or claims are presented, the application is approved by the Department of Fomento, and thereafter the title of the claimant is absolute so long as the annual taxes are paid.

This annual maintenance tax is 12 pesos (about $6.00) per unit area, per year, payable in installments of 4 pesos each, every four months, in advance.

There are moderate State, County (partido) and municipal taxes on gross output.

PERU

(Law of March 23rd, 1909, amended to date of January 1st, 1917)

For the purposes of the law all mineral substances are divided into three classes, as follows:

Class 1.—Building stones and other structural material, abrasives, gypsum, marl, pottery and brick clay, mineral paints, pyritous, aluminous and magnesian earths, limestone, phosphates and peat. These, when found on the public domain, may be acquired by purchase of the surface in the ordinary way from the government. When occurring on alienated land they belong to the owners thereof, and the right to operate upon them may be had only from them.

Class 2.—Guano, saltpeter, sulphur, borax, rock salt, alkali beds and mineral springs. These belong exclusively to the government, no matter where found, and the right to work them can be obtained only by direct negotiations with the authorities.

Class 3.—All other substances. These are subject to the provisions of the mining law. They belong to the Nation as a whole, whether found on public or on private land, and cannot be alienated. But the right to possess and work them in per-

petuity may be acquired by any one capable of holding property in the Republic, whether native or alien, who makes proper application, who operates in accordance with the provisions of the law, and who pays the annual mining tax.

Prospecting is freely permitted on all lands whether publicly or privately owned, except when fenced, cultivated, or built upon, in which cases the consent of the owner must first be obtained. If this is refused the government reserves the right—for sufficient cause—to compel consent, excepting under houses, orchards and gardens. On all other privately owned land the prospector, upon giving the owner reasonable security for possible damages, may explore at will.

Exclusive prospecting areas, called "Provisional Claims" may be obtained on the public domain. Their size may not be less than 140 hectares (about 350 acres), nor more than 1400. They must be located not less than 5000 meters from any existing mining property. Their term is one year, with the privilege of one renewal of equal length.

Mining claims located upon the public domain convey both underground and surface rights within the limits of their lines. But when placed on privately owned land the underground rights only are conferred, and the locator must arrange with the owner for such surface as he may need. Ample provisions are made in the law to protect the interests of the miner in this respect.

The unit lode mining area is a horizontal rectangle 200 meters long and 50 meters wide (about 2 acres), the length to be disposed along the supposed line of strike. Vertical boundaries and no extralateral rights. For alluvial deposits the unit area is a square measuring 200 meters on all sides (about 8½ acres). These units in both cases are called "pertenencias." A "claim" can consist of any desired number of these pertenencias not in excess of seventy. In locating a claim the units must be contiguous along sides, and must be so grouped as to form a rectangular area the long sides of which are not greater than ten times the length of the shorter sides.

The annual tax for lode claims is 30 soles (about $14.50) per

unit or pertenencia contained, payable in advance in two equal installments on or before the 30th of June and the 31st of December of each year. The tax for prospecting or "provisional" areas is one sole (about 50 cents) per hectare of area per annum, payable in advance. If the annual tax is in default for any period less than six months the property may be redeemed by the addition of a penalty of 50% of the amount due. If it is in default for a year the penalty is 100%. After that, it is open for denouncement or location by others.

The procedure for acquiring a claim is as follows: The applicant, having first set provisional corner stakes (no discovery appears to be necessary) makes application before the local government authority on a form specially provided, which may be purchased for five soles. Within three days of the date of this document the authority delivers to the claimant a certificate which grants provisional possession and usage of the premises applied for pending the proceedings for a definite title. During the next 30 days the application is advertised locally, and during the following 90 days an advertisement is carried in the official government Bulletin published in the capital of the Republic. During these 120 days all protests to the application must be filed. If none appear, a day is set—after six days of further local advertising—for the official survey. This being made, and no adjoining or neighboring claimants having objected to the lines of the survey, the applicant is formally placed in possession of the area, and given a written document by the government certifying to his exclusive right to the claim, together with a copy of the map made by the surveyor. These documents are then registered, whereupon the title becomes indefeasible except for non-payment of the annual tax or non-compliance with other provisions of the law. All expenses of advertising, surveying, registration, etc., must be paid by applicant as soon as they become due.

At all external corners indicated by the surveyor substantial monuments must be erected by the claimant, and maintained in good order and condition so long as he retains ownership.

All registration, advertising, surveying and other fees and charges are reasonable.

Complete conveyancing rights exist as soon as the title is definitely granted.

No royalties on output, and no other tax so long as the product of the property is treated and sold in the country.

The law specifically provides that no additional imposts of any kind may be levied, nor any increase made in those provided, for a term of 25 years from the date of the promulgation of the law.

URUGUAY

(Law of July 24th, 1884)

By this law all mineral substances are divided into two classes, called respectively Mines and Non-Mines. The former are the exclusive property of the State, which issues concessions permitting their possession and usage under the provisions of the law. The latter belong to the surface owner when existing on alienated land, and when on the public domain may be acquired in the same way as that employed in taking up agricultural land.

Non-Mines are deposits of those structural substances like limestone, sandstone, slate, granite, gypsum, aluminous and magnesian earths, silica and clay, which, occurring on or near the surface, are usually operated by excavations open to the sky.

Mines include all other substances. Their legal status is that of under-surface property, distinct and separate from the surface. They cannot be conveyed by a deed of the latter. A grant of that nature having been created by the government, they cannot be subdivided as surface real estate may be, but remains an indivisible entity so long as the grant is in existence.

Prospecting is not free. A license must be secured from the local chief authority. This is obtainable by any citizen at a nominal cost, and is good until revoked. Under it explorations may be carried on upon any part of the public domain; and also upon all privately owned property not fenced or cultivated, or covered with buildings or other permanent surface improvements,

under the condition of indemnifying the owners for any damage that may occur as the result of operations, and any number of locations can be initiated upon discoveries made. In addition, with the permission of the owner or, if that is refused, by means of a special government permit that will be issued to any one who will give security for damages that may accrue, prospecting may be carried on for three months on fenced and cultivated land. But no permits will be granted to explore under orchards, gardens, or buildings of any kind without the written permission of the owners thereof, nor nearer than 40 meters to any building, railway, highway, or public utility, or than 70 meters to canals, ditches, reservoirs, public fountains or mineral springs.

The unit of surface measurement for a mining location is the hectare, which may be taken as a square, a rectangle or a polygon, at the option of the locator, so long as the length of the property so constituted is not greater than three times its width. On a lode discovery distant five kilometers or more from any other registered mine a location up to 60 hectares of area is permitted by the law. Within that distance it cannot exceed 36 hectares. For placer deposits and coal the allowable areas are respectively three times those figures.

Discovery of ore is a necessary pre-requisite to the initiation of a mining title. When there are two or more claimants for the same ground the first to register for discovery is held to be the rightful one. In the case of simultaneous applications for such registration, the question is referred to the Courts for adjudication.

Registration is effected at the office of the district judge of the Department in which the property lies, or before the Attorney General of the Republic at the capital. The application must be in writing, and the document must give full particulars and complete information of the situation, with names and addresses of the interested parties, but need not be preceded by the staking of the ground, nor include any definite statement of the area desired. After this act the discoverer may delimit a tract of 12 hectares around his point of discovery, within which, for a term

of 150 days, he is granted exclusive prospecting rights, and during which term he is expected to sink a shaft at least 10 meters deep, and to perform such other development work as will show up clearly the course of the ore body along the surface, its general nature, and the approximate angle of its dip into the earth. Before its end he must stake the area he desires to acquire, and present full particulars of the same for final registration. When this is done the property is surveyed by government engineers, the map and legal description are posted publicly, and advertised for 60 days in one of the daily papers at the capital of the Republic, and in the paper of the Department in which it is situated. During this publication term all objections to the issue of the grant must be formally filed at the office of the district judge. At its end, if no adverses have been presented, the claimant is given a certificate which constitutes his title, and which is incontestable except by the State, and then only for fraud, or for failure to comply with the terms and conditions of the franchise granted.

Within the lines of his property the claimant may enjoy full surface rights as far as the same may be necessary for its proper operation, but no more. The underground boundaries of a concession are determined by vertical planes passing through the lines as marked on the surface. But if, during the operation of the mine, the ore is pursued to one or more of these planes and beyond them into unoccupied territory, the discovery so made is considered the equivalent of a surface discovery, and gives the explorer the right to locate up to 12 hectares of additional ground, taken in such form as he may desire so long as its lines on the surface are straight, and do not encroach upon any other valid and subsisting mining location.

Mining titles are maintained by work. The provisions of the law in this matter are liberal. If, during six consecutive months, less than an aggregate of four laborers per day have been employed in or on the mine, or if during two years the property can be shown to have been unworked for an aggregate of 12 months by less than four men per day per month, abandonment is pre-

sumed and denouncement becomes legal. But if the holder of the title can prove that a shortage of labor, war, disease among workmen, or other unavoidable circumstances have prevented full compliance with the requirements of the law, he will be granted such exemption from his obligations as, in the opinion of the authorities, seems just. Further, any mine which has been in continuous operation for two years or more, may secure the right to suspend operations for a total continuous period of four years, by paying semi-annually in advance a tax of not less than 75 cents and not more than $1.25 (as determined by the district judge), per month per hectare of area in the property.

The government levies a tax of one-half of 1% on the gross value of the output at the mine, if the ore is beneficiated in whole or in part in the country, and 1% if it is exported in its raw state. There is also an export duty of one-half of 1% on all mineral or metal exported, in any stage of refinement.

VENEZUELA

(Law of June 26th, 1915, amended to date of January 1st, 1917)

This law divides mining property into three classes, as follows:

1. The metals, together with graphite, rock salt, salines in general, and sheet mica.

2. Precious stones, onyx, etc.

3. Coal, oil, cement rock, asphalt and allied substances, and fossil gums.

Those of the 3rd class, together with rock salt, salines and mineral springs, which have not already passed away from the ownership of the nation, by grants of the surface, are inalienable, and arrangements for working them can be made only by direct negotiations with the President of the Republic, which take the form of a concession, for a specified term, at an agreed royalty or rental, or both.

Building stone, sand, slate, clay, lime, gypsum, peat, phosphates, marl and other similar substances, are considered as belonging to the owner of the surface, and may be worked without any obligation to the State by their owners, or anybody to

whom the latter give permission. But all mining or quarrying operations on alienated lands are subject to inspection by government officials, who have the right to insist that proper precautions are taken for the safety and health of the workmen. When these materials are found on the public domain, they may be acquired by the purchase of the land from the government as an agricultural or grazing tract, or permission to work them may be obtained by direct negotiations with the President. The same procedure applies to pearls, coral, etc. All contracts made with the President must be confirmed by the national legislature.

In all claims, grants or concessions covering mining rights, conveyancing rights are complete after registration. No production from a mining property can take place until after registration of the title, excepting in the case of "barranca" workings, as hereinafter described.

The law distinguishes between surface and under surface property rights. The first extends to the depth of three meters below the actual surface. The latter begins where the former ends, and continues downward indefinitely. Mining claims and grants of all kinds, except where otherwise clearly stated, as in the cases of alluvial and cement claims, belong to the underground class of property.

When surface owners refuse to grant mining rights (for under surface operations), or demand unreasonable terms, the law provides procedures through which they may be compelled to accept equitable compensation.

Mining claims located, or mining grants given upon unoccupied public domain, carry surface as well as underground rights, and also the right to operate for all classes of substances found therein; but holders of the same are under obligations to notify the authorities of all new or unexpected substances found and produced, so that the proper taxes may be assessed.

When, in the operation of an alluvial or cement property, a lode, vein, or other mineral deposit in rock in place is found by the operators, the discoverer has the preferential right to locate

a claim upon it, or apply for a grant, provided such action is taken within six months of the discovery.

Mineral claims and grants of all kinds are of the nature of contracts between the claimants or grantees and the government, and lapse automatically when any default in the conditions of the contract occurs. The right to acquire them is open to all individuals of legal age, except certain government officials, and to corporations properly organized, whether native or alien.

The unit claim area is the hectare (about 2½ acres). Any number of them up to 200 may be located as one claim, but the block so taken must be rectangular in shape, with width not less than half its length, excepting in the case of dredging areas, which may run up to 2500 hectares, and must be square in form.

Fractions between claims not over five hectares in area will be given to the first adjoining claimant that applies for them, or divided proportionally between adjoining applicants simultaneously applying. Or, they may be filed on by others if adjoining owners do not exercise their rights. All fractions of greater size must be filed upon in the normal way.

Dredging areas are granted for any term up to 50 years; quartz areas up to 90 years.

On all claims and grants serious mining operations must be begun within three years from date of same, unless prevented by circumstances which, in the opinion of the authorities, excuse delay.

Suspension of work (after beginning) for more than three years entails forfeiture, unless excused by authorities. A mine is considered as in operation if ten men are at work during working days, or machinery is running. At least half of the workmen in all mines must be native born Venezuelans.

When a number of claims or grants are consolidated under one ownership, of either an individual or a company, the several parts of the consolidation do not lose their identity. Each must be considered by itself in respect to work for maintaining title, unless formally excused by the Minister of the Interior.

The working of alluvial or cement deposits for gold, or other

native metals, when on the public domain, and so long as the operations are conducted personally by the individual, and with primitive appliances, as with the pan, rocker or long tom, is free. The location and registration of a claim are not necessary, though advisable. If excavating work like open cuts, shallow pits, etc., is necessary to reach the pay gravel, the miner may protect himself against other prospectors by staking out one or more areas ten meters square, upon which registration is not necessary, though the civil Chief of the district must be advised of the appropriation, and a description of the location given him. Similar operations to recover float ore, or the values in the disintegrated outcrops of veins or other forms of surface metalliferous deposits, may be carried on without registration. But such operations do not protect the prospector if he pursues mineral below the surface soil and into bed rock. Unregistered appropriations of this nature may at any and all times be cancelled by the authorities if, in their opinion, the public interests demand it.

Titles to claims and grants are maintained by the annual payment of taxes, and of royalties on output, any default in which automatically works forfeiture. These, transformed approximately into American money are as follows:

Ten cents per annum per hectare on claim or grant area.

Two cents per gram of gold, platinum, or mercury recovered.

Two-tenths of a cent per gram of silver recovered.

Ten cents per ton of ore sold or treated by its producer.

No tax or royalty on metal recovered from unregistered workings or claims.

Registration fee $1 plus five cents per hectare, plus three cents per hectare if producing any base metal, and plus two-fifths of a cent per hectare when the claim is located on private property.

All mining operators must keep books of account, in one of which the amount of ore produced must be recorded, and in the other the weight of metals recovered. Before being used, these books must be submitted for inspection by the local authority, and validated for use by the signature of the local Judge and his clerk.

Imported mining machinery with spares, tools, steel, chemicals and explosives are free from duty.

All mines are subject to visit and inspection at all reasonable hours by the government engineer, and must be operated (as to methods and appliances for safety of the workmen and the plant) in ways satisfactory to him.

Prospecting by natives, and by aliens when properly authenticated, is free on the public domain, after notice is given to the local civil Chief of the intention, and of the locality to be explored. But excavations must not exceed about 50 feet square in any one place, though they may be of any desired depth.

Upon alienated areas the permission of owner must be secured, but cannot be asked for under buildings, fenced or cultivated lands, or public property (towns, cemeteries, etc.); nor within 150 feet of a railroad, or a mile of fortifications.

Exclusive prospecting rights may be obtained on the public domain for areas not over 800 hectares (about 2000 acres), and for terms not over one year, but a year's extension will be granted for good cause. As soon as payable mineral of any kind is found on such areas, the local authority must be notified, and production cannot begin until a contract has been arranged with the Minister of the Interior, and his permission secured.

The location and registration acts required by the law are fairly simple and inexpensive. Claims must first be staked out by the claimant, who then makes written application to the civil Chief of the district, giving information as to area desired, situation of same, position of adjoining or neighboring mines (if any), names of owners, and the kind of ore and the nature of the deposit expected to be developed. This is followed by 30 days of advertising, in the local paper if one exists, otherwise by means of 200 handbills, ten of which are posted in public places in the district, and the remainder carefully distributed among the inhabitants. If no objections are filed with the authorities within this period, the claim is inspected and surveyed (at cost of claimant) by the local inspecting engineer, after which the claimant is put into physical possession, and his title becomes incontestable,

except by the government for default in the payment of taxes or royalties, or for failure to operate in accordance with the instructions of the district inspector of mines, or to comply with labor conditions.

Grants made for a specified term of years are renewable under reasonable conditions.

Fees of all kinds are moderate, also surveying charges.

RESULTS

In the sixty-six-year period from 1851 to 1916 (inclusive) the contribution of Latin America to the metallic wealth of the world has been as follows:

Gold	$968,875,941
Silver	2,856,861,933
Copper	873,067,692
Tin	252,767,135
Lead	201,909,861
Zinc	25,152,190
Total	$5,178,634,752

The four principal contributors to this result have been Mexico, Chile, Bolivia and Peru. Of these the first has proved to date by far the most productive, as shown by the following table.

	Mexico	Balance of Latin America
Gold	$380,339,383	$588,536,558
Silver	1,955,984,995	900,876,938
Copper	329,849,914	543,217,778
Tin	.....	252,767,135
Lead	193,057,936	8,851,925
Zinc	25,152,190	
	$2,884,384,418	$2,294,250,334

For the purpose of comparing the condition of the industry in this mining group with those of the other groups under consideration in this work, it has been deemed advisable to avoid all figures later than those of 1913, because of the great advance since then in the value of all the metals except gold, and the corresponding fall in the purchasing power of the latter. The table

which follows has been prepared on that basis. It should be remembered that at the beginning of the period it covers, the industry of precious metal mining had already been well established in all the countries included.

Latin America, 1851 to 1913 (inclusive): Mexico, Central America and South America (except British, Dutch and French Guiana)

Metal	Term	Years in term	Total product of term	Average annual product during term	Production of 1913	Gain (+) or loss (−) in 1913 as compared with average
Gold.....	1851 to 1913	63	$870,115,941	$13,811,364	$33,517,121	+143%
Silver.....	1851 to 1913	63	2,716,821,933	43,124,157	50,614,308	+ 17%
Copper....	1879 to 1913	35	741,131,252	21,175,178	40,941,600	+ 93%
Tin.....	1885 to 1913	29	198,175,011	6,833,517	28,961,804	+335%
Lead.....	1887 to 1913	27	185,629,960	6,874,443	5,337,821	− 20%
Zinc.....	1906 to 1913	8	15,461,532	1,932,691	694,960	− 64%
			$4,727,335,629	$93,751,350	$160,067,614	+ 71%

In the year 1851 the gold production of Latin America was valued at $5,793,334 and that of silver at $25,374,605. There were no other metals produced except a small amount of copper for local consumption. Copper ore began to flow from Chile to Europe for reduction about 1870, but the amount did not become important until 1877. The exportation of tin concentrates from Bolivia commenced about 1885. In 1887 Mexico began shipping silver-lead ores to American smelters, and argentiferous zinc ores about 1900. During the sixty-three year period from 1851 to 1913 the metal mining industry of Latin America made the substantial progress that might be expected in a region of such great mineral resources, when once the business became firmly established, and particularly in Mexico which has been so vigorously exploited during the last thirty-five years by American

capital. In fact the industry in that country has been mainly responsible for the gain of 71% over the average output of the entire region, though the growth of tin mining in Bolivia has been notable, as well as of copper mining in Chile and Peru. The gain in gold is largely due to Mexico, where a production of $29,196,026 was attained in 1911, and by this time would have exceeded that of all the rest of Latin America but for the unsettled political conditions that have prevailed there since 1911. In fact, ever since about 1888, the metallic output of that country has continuously been greater than that of all the rest of Latin America combined. In 1910 the figures were, for Mexico, $93,942,382, and for the balance of the members of the group $62,219,214.

From this interesting showing it would seem to be a safe conclusion that the Latin American system of mining law produces its best results—so far as the matter of output is concerned—when pushed to its extreme in principal, as is the case in Mexico where there are absolutely no restrictions to the amount of ground that may be acquired and held, so long as the very moderate annual taxes thereon are paid, while in addition no discovery is required. On the other hand the extreme poverty of the masses in that country in the face of the great production of new and permanent wealth, coupled with the concentration of mining territory in the hands of a comparatively few, much of which is idle, and the complete absence of small holdings, reveal the unfortunate effects of a law which does not specifically and definitely encourage and foster surface exploration and individual enterprise.

Considering the group as a whole, substantial progress has taken place in Mexico, Chile, Bolivia and Peru. In the Central American states, and in Columbia and Venezuela there has been little growth in the industry for the last twenty-five years. In Ecuador, Brazil and Argentina mining is actually declining. In Paraguay and Uruguay the production of metals is unimportant. In the countries of the first group the mining laws are the most up-to-date of their class, and very favorable to the investor. The instability of political conditions in the second sufficiently

explains the stagnant condition of the industry among them. These countries produce little but gold, the most of which is recovered by natives operating in a small way on river bars, and using only the most primitive applicances. In Ecuador and Brazil the mining laws have never been modernized, and are in very bad shape. In Argentina the latest revision and codification is far too elaborate, and in a number of matters is seriously restrictive, showing a movement away from the simple principles of Spanish mining law.

From Mexico since 1889 has come, as shown, more than half of the metallic output of Latin America. All of the zinc, practically all of the lead, 37% of the copper, 39% of the gold and 68% of the silver. Its law, from the point of view of the investor, is by far the most simple and liberal of its class, and has served to attract enormous amounts of American capital to the development of its mines and the establishment of its metallurgical industry.

On account of the great number of well-known but yet idle mining properties throughout the whole of Latin America, many of which are known to have been highly productive in the past and are by no means exhausted, it will be many years before the admitted lack of prospectors in the field will be left. The doctrines upon which those of its mining laws that have been modernized rests answer all needs of the working populations in their present state of semi-servitude. Nor are they breeding conditions that will require revolutions to correct them when the time comes in which the pioneer mineral explorer will be needed to lead the way to the discovery of new fields.

In the foregoing resumè the statistics of British, Dutch and French Guiana have been omitted, because, as will be seen by an examination of their mining laws as given elsewhere, such mining as is in progress is being conducted under quite different systems. In all three, though favored with abundant mineral resources, the industry is in a depressed condition.

CHAPTER VII

The American System of Mining Law. Digest of the U. S. Federal Mining Law. Digest of the Mining Law of Texas. Results of the American System. Statistics of the Production of Precious and Base Metals from 1851 to 1916

THE AMERICAN SYSTEM

The American system of mining law is based upon the theory that the unappropriated public domain of the United States belongs to the people of the nation individually, together with all mineral deposits existing thereon, and that any native-born citizen, or an alien who has formally (under the naturalization laws) declared his intention of becoming one, may freely at any time, and to an unlimited extent, search for and appropriate any deposit that he may be the first to discover, by following the procedures prescribed by laws made by themselves. As to those existing upon land already appropriated, the necessary corollary is that they belong to the recorded owners thereof, and may not be taken away except for public use under the operation of the doctrine of eminent domain.

The system in its details has two eminently distinctive features. The first of these is that the steps prescribed for the initiation and maintenance of mining titles are not mandatory so far as the government is concerned. All may be omitted or neglected by the prospector and miner, even to the matter of recording his discovery, and yet, so long as the tract appropriated remains in his physical possession, he may extract ore therefrom and convert the same into money free of all obligations to the authorities. But, on the other hand, failure to perform any one of the acts

prescribed in the law gives to any fellow citizen who desires to possess his ground the right and opportunity to attack his title and assert a legal claim for the possession of any part or the whole of it. In the case of a contest of this kind the attitude of the government is simply that of a preserver of the peace until the courts, before whom both contestants must appear and give evidence, have rendered a decision upon the facts presented.

The second feature is the nature of the extralateral right of pursuit conferred upon the lode claim. Differing from the theory of the old Spanish laws and some of the modern Latin-American ones, it gives this right not only to the vein first discovered and to its complete extent in depth, but also to all others whose apexes can be shown to lie within the boundaries of the claim, either at its surface or vertically below any part of it. Again, differing from the theory of the old German law, this right of pursuit is confined strictly to the ore-bearing channel or channels that may exist, and does not include any portion of the country rock enclosing them.

To understand properly the American system and gauge its comparative worth, it is necessary to know its history.

From the time when mining first began in the western United States (1849) until 1865, a period of nearly 16 years, titles to mineral property were initiated and maintained under laws made by the miners themselves. The industry began in California and spread north, south, and east from there, and the district laws framed by the pioneers of that State were reproduced in very nearly identical tenor so far as fundamentals were concerned in all other parts of the newly opened region. These laws were based upon the physical conditions encountered by the miner in California and recognized two classes of claims called respectively placer claims and lode claims. Priority of discovery and of staking determined the matter of ownership in both cases. The matter of size varied broadly in accordance with varied local conditions. Claims of both kinds could be recorded and possession was maintained by work. It was quickly realized that the placer claim was a temporary holding to be abandoned as soon

as worked out or exhausted to such a degree as to be no longer interesting. The lode claim, however, was another and quite different affair, and the discoverer was deemed to have acquired the right to pursue his ore body downward as long as he cared to do so, regardless of where it led him. Thus, independently of the principles that had governed in other mining regions in the past, the doctrine became firmly held as properly applying to all kinds of mineral deposits other than alluvials.

It was not until 1865 that Congress passed any legislation affecting mining titles, and then the only action taken was to announce the principle that in the matter of disputes between claimants to the same piece of land, while the source of title must be recognized as reposing in the Federal government, the latter merely acted in the capacity of Trustee for the people, had no inherent rights of its own in mineral land, refused to assert any as between contesting claimants to any tract, but would pass title to that contestant who in the courts established his superior rights. The language of the Act was as follows:

Section 910 of the Revised Statutes.

"No possessory action between persons, in any court of the United States, for the recovery of any mining title, or for damages to such title, shall be affected by the fact that the paramount title to the land in which such mines lie is in the United States; but each case shall be adjudged by the law of possession."

In the following year this theory was again stated in slightly different form, as follows:

Sec. 1 A. C. July 26th, 1866.

"The mineral lands of the public domain, both surveyed and unsurveyed, are hereby declared to be free and open to exploration by all citizens of the United States, and those who have declared their intentions to become citizens, subject to such regulations as may be prescribed by law, and subject also to the local customs and rules of miners in the several mining districts, so far as the same may not be in conflict with the laws of the United States."

No further Federal action was taken for six years, when the above given section of the Act of 1866 was repealed, and in its place the following was enacted:

Section 2319 of the Revised Statutes, being Sec. 1 A. C. May 10th, 1872.

"All valuable mineral deposits in lands belonging to the United States, both surveyed and unsurveyed, are hereby declared to be free and open to exploration and purchase, and the lands in which they are found to occupation and purchase, by citizens of the United States and those who have declared their intention to become such, under regulation prescribed by law, and according to the local customs and rules of miners in the several mining districts, so far as the same are applicable and not inconsistent with the laws of the United States."

These enactments were followed by a number of others, not necessary to be quoted here, all of which had for their object either to acquiesce in and confirm the laws and customs already established by the miners, and already in force for nearly a quarter of a century, or to supplement them by such legislation of the same democratic kind as seemed necessary to clear up ambiguities and uncertainties. It was a difficult task. The miners' laws were not the result of much knowledge either of jurisprudence or of economic geology, but were simply the unorganized expression by the rough and ready pioneers of the day of natural human aspirations in one line of activity which at the time seemed possible of realization. It was an unexplored and unoccupied land of which they had taken possession. The populations that flowed into it from all sides, like air into a vacuum, consisted mainly of American working men of limited education but unlimited virility, and well endowed with common sense and fundamental ideas of justice. No government or law existed beyond what was left of the futile and patriarchal Spanish sovereignty, which was at once brushed aside as impossible. Communication with the politically organized parts of the nation was slow and infrequent. The first mineral deposits found outside of those of alluvial gold were the well-defined and orderly fissure

veins of the Californian Sierras, which submitted themselves readily to the extralateral rights doctrine.

Naturally, as exploration advanced and new kinds of mineral deposits were discovered, difficulties arose. Many of great value were found which fitted badly into the letter of the law. In consequence a vast amount of litigation ensued, and for 30 years or more (1870 to 1900) the western courts were burdened with the problems presented. Little by little, however, interpretations were agreed upon, precedents accumulated, and light began to shine through the legal maze. During all this time the miners who had to live and operate under this inchoate law exhibited a truly American patience, refusing to ask for any change in fundamental principles, and bearing the disappointments and losses that resulted with perhaps a considerable appreciation of the idea that a free people must expect to pass through just such a period of stress and storm to hold on to a system based, as this was, on purely democratic foundations and experiences.

At the present time it is considered that practically all matters of interpretation necessary to fit the law to all varieties of geological structure so far encountered have been settled by the higher courts of the land. Now, looking backward to 1849, when its basic principles were first established, it appears that during the years that have followed there has arisen under its provisions an industry so remarkable in its extent and vigor, so continuous in its advance and so promising for its future, as to fully warrant the troublous years through which in its youth it has been compelled to struggle. It would be foolish to contend that the law is perfect, or that it cannot be much improved, but when results accomplished under it are compared with those obtained elsewhere under different systems, it becomes necessary to admit that its fundamental principles are sound. These may be concisely stated as follows: First, free prospecting privileges, coupled with simple and inexpensive rules for the initiaton of titles, and responsibility for its maintenance to the fellow citizen instead of to the government; and second, the extralateral right of pursuit for all forms of mineral deposits that possess continuity

in length and depth, no matter to what geological class they belong, or what difficulties may be encountered in following them, which constitutes it as the property granted by the people to the individual who discovered it. This is the magnet that first attracted the prospector, and which has ever since held his interest and retained his services. No mineral district in the world has been so thoroughly explored as that of the western United States, nor does any begin to compare with it in results obtained, and yet, after nearly 70 years of energetic search the processes of discovery are still actively at work, each year bringing to the notice of capitalists new deposits of ore worthy of their attention, hundreds of which annually pass from the condition of prospects into that of producing mines.

In all other parts of the world discovery of new mineral resources and deposits, except by accident, has largely ceased, for nowhere else does the prospector exist. By a most fortunate combination of circumstances, entirely unpremeditated, the American mining law gave the mineral pioneer his opportunity, for under its provisions he has been able to initiate a title to a class of real property which had an inherent selling value because of the nature of the claim he could make, and regardless of the degree and amount of developing he might or might not be able to do upon it. That is the secret of the remarkable outcome. It has resulted in the Rocky Mountain region becoming the greatest metal-producing district of the globe.

UNITED STATES

(Act of Congress of May 10th, 1872, with additions and amendments to date of January 1st, 1917)

The public domain in that part of the United States comprised in the States of California, Colorado, Arizona, Idaho, Montana, North Dakota, Nevada, Oregon, New Mexico, South Dakota, Utah, Washington, and Wyoming, and the Territory of Alaska, are under the jurisdiction of what is known as the Federal Mining Law, the theory of which is that these regions from the beginning of their settlement are the common property of the citizens

of the United States, and are open and free to exploration and occupation by them subject to such regulations as may be from time to time prescribed by the District laws as made by the miners themselves, the Territorial and State laws enacted previously to May 10th, 1872, and the Federal law of that date with such amendments and additions as may since have been placed upon the Statute books by Congress.

Prospecting is free. Any citizen of either sex, or alien who has declared his intention of becoming a citizen, if of legal age, may prospect and operate upon unoccupied land, may locate as many mining claims as desired and hold and work them without rent, royalty, or any form of Federal tax or duty, so long as the provisions of the law in respect to mining property are observed; and, after the completion of $500 worth of developments or improvements in or upon such a claim, application may be made for a patent, which, when allowed after due formalities, conveys fee simple title to the surface within the boundaries of the same; and, in addition, for lode claims, the right of indefinite pursuit in depth beyond side lines, but within planes passing through end lines prolonged horizontally and vertically indefinitely, of all veins, lodes, or other classes of deposits occurring in rock in place, the top or apexes of which appear on the surface within its lines, or may be found beneath that surface if yet within the vertical planes projected downward through its boundaries. There is no obligation on the part of the claim holder to apply for patent, and all the rights enumerated above are inherent to the possessory claim from the date of its location.

Four classes of claims are recognized, namely, Lode claims, Placer claims, Mill sites, and Tunnel sites.

The Lode Claim is a parallelogram measuring 1500 feet along its center line and 600 feet (or less) in width at right angles thereto. End and side lines must be parallel to each other. Discovery of mineral in rock in place must occur before the claim may legally be staked, but not necessarily of commercial value. A post is first erected at the discovery pit or open cut or shaft with a notice thereon giving the name or names of the locators, the

date of the discovery, and the name of the claim. Thereupon the surface side and end lines are indicated by means of substantial posts or monuments erected at each angle, and at the center of the end lines. Within the succeeding 60 days the locator must perform enough excavating work to clearly show ten feet or more of the lode in depth. The surface boundaries may be so disposed that the discovery shaft is situated at any point desired, so long as it is within them. Within 90 days after discovery date the claim must be recorded at the office of the Clerk of the County in which it lies, and this record, in addition to the facts given on the location notice, must include such a description of the situation and its vicinity as will serve reasonably to identify the ground. The recording fee is $1.25. As soon as record is made, conveyancing rights of all kinds are complete, and the work performed makes the claim a valid and subsisting one until the end of the calendar year in which the location was made, and also to the end of the year following. But at some time during this second calendar year, at his convenience, the claimant must begin the annual assessment work, and should complete it if possible before the year ends. But, if that be impossible, any balance left undone at the end of the year may be finished up in the year following, provided the work so left over is finished up without cessation of labor on each working day. This annual assessment work consists of the expenditure in labor or improvements of $100. At any time after it is finished the claimant may record an affidavit evidencing the performance of the work, and such a document (which, however, is not obligatory) is held to be prima facie proof of the continued validity of the title.

No survey is required. The law does not provide any specific conditions under which forfeiture shall automatically take place. If the annual work is not performed, any individual who desires may locate the ground in his own name. But, unless and until such a party enters the claim, and performs thereon all the proper acts of location as heretofore described, the first title continues valid and subsisting in spite of the failure of its owner to do the annual work.

The Placer Claim is a tract of 20 acres, and any number of them may be taken by an individual. If located upon unsurveyed public land such claims may be of any shape necessitated by the topographical features of the vicinity. But if placed upon surveyed land they must conform in shape, area, and position to the legal subdivisions established by the government. An association of eight individuals may locate eight of such 20-acre tracts adjoining, making thereby what is called a "joint location," and may repeat the process indefinitely. Each of these two kinds of placer claims when located must be provided with a discovery notice and posts at each corner or angle of the claim, and within 90 days thereafter must be recorded. The annual labor requirements for the maintenance of possession as against other citizens are the same as for lode claims, regardless of whether the claim is a single one of 20 acres, or a joint location of 160 acres. When the claim is situated upon surveyed land no location or discovery shaft is required.

Any class or kind of mineral deposit, excepting lodes and other aggregations of minerals in rock in place, such as coal, metalliferous alluvials, mineral oil and gas, asphalts, salines, sulphur; building stones, etc., may be acquired by the filing of placer claims. This form of mining title confers no extralateral rights, nor the right to own or operate any vein or lode or any other kind of mineral deposit of that class, that are known to exist as passing through or under it, at the time of location, or of application for patent. But any lodes that may be discovered within its lines after the last date belong to its owner, but may not be pursued in depth outside of its lines projected vertically downward.

The Mill Site is a five-acre tract, one of which may be located for each lode claim taken. It is supposed to be placed on nonmineral land, and nominally has no mineral rights. The proeedures required in the processes of location, staking, and recording are similar to those for lode and placer claims. If allowed to go to patent without contest, all underground and surface mineral rights are acquired except that of the extralateral pursuit of any veins or lodes that may at any time thereafter be discov-

ered having apexes within its surface lines, except as to such as were known prior to the date of patent application.

The Tunnel Site is a tract of land 3000 feet long in the direction of the line of the bore, and as broad as the width of the same, along which the claimant has the exclusive right to drive, and to acquire the ownership of all veins found while doing so that have not been (at the time of the intersection) already discovered and claimed on the surface, to the extent of 750 feet on each side of the center line of the tunnel. This line should be blazed and staked on the surface at intervals of 500 feet, a notice posted at the entrance and a copy of the same recorded. When a new vein is encountered it must be staked on the surface in the ordinary way of lode claims, taking into account the angle of dip as shown in the tunnel, and recorded, but no discovery shaft is required. By this procedure the claimant acquires the right of way through patented and unpatented claims along his line, and the ownership of whatever ore may be found in passing through them, but not the right to drive, sink, raise or stope upon them. When the 3000-foot limit is reached he may continue his operations indefinitely along the same line, and if more unknown veins are found they may be staked and claimed on the surface, but in this case discovery shafts must be sunk upon them. No patents are obtainable for tunnel sites, but work done in driving them (up to a length of 3000 feet) can be applied as assessment work on the new veins cut and claimed within that distance, and the locations made on such veins may be patented in the ordinary way. Beyond the 3000-foot limits the driving costs cannot be applied as assessment work on new veins found. The law makes no provisions for the abandonment or forfeiture of tunnel site claims.

There is no obligation on the part of owners of lode or placer claims or mill sites to patent, and the possessory title when duly maintained by the annual assessment work is exactly as good as it would be after patenting so far as the rights of the claimant are concerned. The steps required for the act are somewhat expensive and complicated, and the services of an attorney are generally necessary. The last step is that of payment for the land.

For lode claims and mill sites the price is $5 per acre or fraction thereof, and for placer claims $2.50 per acre. When the land is paid for and the patent is granted the document evidencing it confers a fee simple title and thereafter no annual assessment work is required.

Unpatented mining claims are not taxable by the State, as they enjoy the status of being still a portion of the Public Domain, no matter how extensively they may have been developed by their owners, nor how large may have been the profits derived from them.

Patented claims are taxed by the States on the same basis as other real estate within its borders, which is that of their assessed valuation as determined by their acreage and the value of the improvements thereon. In addition to this, some of the mining States impose a tax either on gross product or on net profits. There are no Federal taxes or royalties of any kind on mining property held under the Federal mining law.

Owners of lode or placer claims or mill sites enjoy exclusive right to the possession and usage of the surface within their lines and all things thereon such as timber and water; and, on the other hand, are under the obligation to allow all reasonable and necessary easements to adjoining and neighboring owners.

Prospecting or mining on private land the title to which has been obtained through laws other than those pertaining to mining, except with the consent of the owner, is illegal, and there are no means by which such owners may be compelled to allow such privileges. But the owner of a lode claim may pursue his vein underneath the surface of such property without permission. On the other hand, the owner of such a tract has the exclusive right of possession and usage of any kind of mineral value that may be found thereon, but not the right to pursue any vein or lode that may outcrop within his lines beyond the same.

The law makes suitable provisions for water, reservoir, ditch and tailing rights and sites.

In most of the States in which the Federal Mining Law governs mining rights, the States themselves have enacted supplementary

laws which provide for and cover contingencies not contemplated in the National Acts. None of these can change the fundamental principles upon which the latter is based, but do enlarge in matters of detail. There is little variation from each other in these State laws, and in a work of this kind no necessity of presenting digests of them. But whenever mining operations are contemplated under the Federal law it will always be advisable, and sometimes quite necessary, to take into account the law of the particular State in which they are to be conducted.

DIGEST OF MINING LAW OF TEXAS

(Act of 1913, with amendments to date of January 1st, 1917)

All public lands of all kinds, all lands heretofore sold with mineral reservation, and all those which may hereafter be sold with such rights reserved; also all lands purchased to date, or which may hereafter be purchased with relinquishment of the mineral rights therein, are placed under the provisions of this Act, and are thrown open to citizens of the United States, and such as have heretofore or may hereafter declare their intention of becoming citizens, to prospecting and to occupancy for mining purposes, under the leasehold system. To this end, mineral deposits are classified as follows:

1. Petroleum and Natural Gas.
2. Coal and Lignite.
3. Metals and other Minerals.

In the first case (oil and gas), a maximum area of 1280 acres, or two square miles, is allowed to an individual or corporation, but not over 200 acres within 10 miles of a producing and operating well. Application for the ground desired must be made to the County Surveyor, and after certain simple and inexpensive formalities have been complied with, a permit is issued giving the applicant the right to drill or otherwise explore under reasonable conditions. If oil or gas is found in payable quantities, the operator, before removing any from the premises, must take out a

lease. This may run for any period up to 10 years, and costs $2 per acre per annum in advance. In addition, a royalty of 12½% of the gross value of oil sold, and 10% of the gross value of gas, is demanded by the State. When such leases are taken out for lands the surface rights of which have been alienated, the lessee must also pay 20 cents per acre per annum to the surface owner.

In the second case (coal and lignite), the application to prospect is made to the Clerk of the County, and the maximum area allowed is 2560 acres, or four square miles. The term is 20 years, with preference renewal right at end of same. The State demands a royalty of four cents per ton on lignite and six cents per ton on coal, payable monthly on sales; but after the third year of operations this royalty must amount to not less than the equivalent of $4 per acre per annum on the tract.

In the third case (all other minerals), the ordinary mining claim is a parallelogram 1500 feet long and 600 feet wide, of unlimited vertical depth, and conveys no extralateral underground rights. No prospecting license is required. The location acts are simple and inexpensive. No discovery of mineral seems to be required, but a 10-foot shaft or open cut must be excavated before recording. Three months' time after date on location stake is allowed for this and other preliminary acts. Recording fee is $1. Within one year an official survey is required, for which a charge not to exceed $20 is allowed to the County Surveyor. When his plat and field notes are completed they are forwarded to the Commissioner of the Land Office of the State together with a filing fee of $1. As soon as these documents are accepted the title is complete, and is maintained thereafter in good order by the doing of $100-worth of work or improvements per annum on the claim, and the filing of an affidavit in the Land Office evidencing the same. No more than five of these claims are permitted to be held at one time by an individual or corporation.

If it is desired to locate a placer claim, or one to cover a deposit of clay, baryta, salt or other salines, building stone, gypsum, mineral paint, nitrates or any other non-metallic earthy

substance, the procedure is identical, but the claim may be up to 40 acres in area. It must conform to legal subdivisions if possible, and no individual or corporation is allowed to hold more than eight of these at one time.

On all metals and minerals extracted and sold from claims of this third class, the State demands a royalty of 5% per annum on the gross value of the output.

Mining claims of all kinds, after the title to the same is perfected, are subject to taxation, like all other forms of real property.

RESULTS

The metallic product of the mines of those western American states that operate under the provisions of the Federal mining law, for the sixty-six year period from 1851 to 1916 (inclusive), has been as follows:

Gold	$3,695,922,075
Mercury	104,721,907
Silver	1,930,478,241
Lead	616,335,082
Copper	2,633,672,533
Zinc	155,785,934
	$9,136,915,772

As the discovery of gold in California occurred in 1847, becoming so well known during 1848 that the stampede for the mines was in full swing in 1849; and as the generally accepted output of that metal for 1851 was $55,000,000, it is probable that the foregoing figures should be greater by at least a hundred millions to correctly represent the total metallic output of the West to the close of 1916. In 1853 the early maximum gold production of $65,000,000 was reached, after which date there was a slow but steady decline to the figure of $30,000,000 in 1883. This was followed by a steady annual increase until the prevailing figures of recent years were attained, which have been less than ninety millions per year only once since 1905. The output of 1916 was valued at $92,251,400.

The production of mercury began almost at the same time as that of gold, the value of the yield of 1851 being officially rated at $1,334,707. The maximum output of $4,233,562 was reached in 1875, when silver production at the Comstock lode in Nevada was at its hight, and also about the time when the smelting industry was beginning in the West. Silver production also began with that of gold but until 1861 consisted only of such small amounts each year as were recovered from placer gold. From that date onward, as the mines of Nevada, Montana, Utah and Colorado were discovered and developed, it became a steadily increasing factor in the total product of the West, reaching a maximum in 1889 of $66,396,988 when the Leadville, Creede and Aspen districts in Colorado were at their best. A serious decline followed as the result of the demonetization of the metal in 1893, recovery from which is not yet complete. The value of the product of the year 1916 was $47,957,540.

Lead production began in 1873 and has steadily grown in importance. The yield in 1916 amounted in value to $48,672,872.

Beginning in a small way in Colorado in 1871 the yield of copper from the western American mines has outstripped the record of that of all the other metals put together, its value in 1916 having been the remarkable sum of $447,229,448, nearly three times that of 1913. The figures for zinc have been almost as astonishing. Production began in 1903, and by 1916 had attained a value of $69,253,776. In the case of both of these metals the major part of the gain over the figures of 1913 has been due to the advance in the market price since the beginning of the European war.

These figures are witnesses of the remarkable growth and vitality of the western American mining industry, and are particularly notable in the case of the precious metals as showing that during the final years of the term under consideration the output of gold was greater by nearly 50% than that of the best year of the days of placer mining, while that of silver was within 20% of the best year previous to the demonetization of that metal.

For the purpose of comparing the condition of the industry under normal conditions with that of the other five great metal mining regions of the world, the following table is presented, covering the sixty-three year period from 1851 to 1913 inclusive, omitting the figures for 1914–15 and 16, during which years such abnormal prices have prevailed for all the metals that comparisons in terms of value of output are out of the question. It shows substantial gain over the average of the term in the output of all the metals except mercury, which, being no longer used in the treatment of silver ores, and much less than formerly in the

Western United States, 1851 to 1913 (inclusive): Alaska, Arizona, California, Colorado, Idaho, Nevada, New Mexico, North Dakota, Oregon, South Dakota, Utah, Washington and Wyoming

Metal	Term	Years in term	Total product of term	Average annual product during term	Product of 1913	Gain (+) or loss (−) in 1913 as compared with average
Gold.....	1851 to 1913	63	$3,411,336,375	$54,148,196	$88,844,400	+ 65%
Mercury...	1851 to 1913	63	98,495,202	1,563,416	813,171	− 48%
Silver.....	1851 to 1913	63	1,805,795,101	28,663,414	40,348,100	+ 40%
Lead.....	1873 to 1913	41	512,015,787	12,488,189	23,738,050	+ 90%
Copper....	1879 to 1913	36	1,865,442,235	51,817,840	156,895,751	+203%
Zinc.....	1903 to 1913	11	51,261,208	4,660,109	14,172,620	+204%
			$7,744,345,908	$153,341,164	$324,812,092	+111%

recovery of gold, suffered such a serious loss of demand and price that the suspension of operations at all but the largest Californian mines became advisable. However, immediately upon the revival of prices in 1914, production was resumed, and at the present time in value is nearly three times that of the average of the period, the output of 1916 having sold for $3,643,800. In reality, the case of mercury is one of the evidences of the substantial condition of the metal mining industry in the West, for it signifies

not only the passing of the crude and uneconomical amalgamation process, but the rise and remarkable growth of the smelting industry, and of the mechanical concentration of ores at the place of their production; in a word, of the firm establishment of the metallurgical industry. In this respect the western American mining field is being operated at the present time under better conditions than exist in any other part of the mining world.

CHAPTER VIII

The British Australasian System of Mining Law. Digests of the Mining Laws of New South Wales, New Zealand, Queensland, South Australia, Tasmania, Victoria, and West Australia. Results of the System. Statistics of Production from 1851 to 1916

THE BRITISH AUSTRALASIAN SYSTEM

The Australian system of mining laws includes those of New South Wales, New Zealand, Queensland, South Australia, Tasmania, Victoria and West Australia, and they resemble each other in fundamentals while differing markedly in detail. The metal industry in that part of the world had its inception in the discovery of gold in 1851 in New South Wales, which was, at the time, a convict colony of the British Empire. When the event became generally known the stampede from all parts of the world to the new El Dorado rivalled that which was at the time in full swing towards California, where the precious metal had been found four years previously, and in which many Australians had taken part. Quite a number of these returned immediately to the island continent, carrying with them not only the mining experience gained in California, but the free spirit and ways of the American pioneer, and an acquaintance with the code of mining laws that had been established by them to govern operations in a land where no laws on the subject were in existence. As those laws, in both spirit and practice, were extremely favourable to the individual worker, who constituted then almost the entire body of the new American state, they were adopted almost without change in the new Australian community, and remained in force there until 1866, by which time many agricultural and

commercial communities had been established, and had acquired enough population to outbalance that of the mining centers. When this condition was reached the natural conservatism of the British temperament moved towards a revision of the laws to bring them more in line with the system of land tenure in effect in the older country and the abolition of that particular feature in the American code—the apex and extralateral right doctrine—which was not only novel but rather repugnant to English ideas, and which there, as in America, had resulted in much litigation. When making these changes public sentiment went to the other extreme and produced a group of mineral acts which were so ultra-conservative, so minutely detailed, and so carefully protective of property rights that little room was left for the exercise of individual initiative and enterprise. In consequence, explorations in the sense of searching for the indications on the surface of new mineral deposits were immediately checked, many of the class of wandering pioneers left for other lands where they hoped to find freer conditions, and as soon as the wonderful placer deposits began to exhibit signs of exhaustion the industry gave indications of decline. This phase has persisted with occasional reactions, and at the present time throughout the great island, whose geological structure, so far as known, should make it one of the most productive mineral fields of the world, the metal mining industry is in a condition of stagnation that is most discouraging. Although all the officials of the province have endeavored to stem the current by offers of liberal state rewards for new discoveries, and liberal tenders of state help in mining-development work, the metallic output does not increase in quantity as it should.

In all the political units of British Australasia the State claims the exclusive ownership of deposits of the metals, both precious and base, whether occurring upon the yet vast area of unoccupied public lands, or upon privately owned tracts (with certain small exceptions as to areas alienated before given dates, and certain others dedicated to public usage, or held as native or forest reserves), and will not grant fee simple title to any of it

for mining purposes. Instead, except in West Australia, it grants first, temporary prospecting areas of various sizes and under various conditions, within and during the term of which the holder is permitted to locate claims if anything of value is found; second, it allows the location of a great variety of claims of different sizes and for different purposes without the preliminary step of taking up prospecting areas, which may be held indefinitely on the condition of reasonably continuous work and the payment of a moderate annual tax, which claims, at the option of the holders thereof, may be converted at any time into long term leases. The latter are renewable once in the case of New South Wales, Queensland, West Australia and Tasmania, and indefinitely (at the discretion of the authorities) in the case of Victoria. In South Australia and New Zealand no renewals are granted.

Prospecting is nowhere free. Licenses, good for a year, and for the location of one claim only, are issued by Queensland, South Australia, Victoria, West Australia and Tasmania, at costs ranging from two shillings and sixpence to ten shillings, while in New Zealand the license, costing five shillings, allows the holder to locate each one of nine different kinds of claims. In Tasmania only one license at a time may be held by the prospector, and it must be for a specified area. Elsewhere any number may be taken out by an individual, or bought from others.

These licenses cover full mining and realization rights in New South Wales, Queensland, South Australia and Victoria. In West Australia they confer only the privilege of the inspection of the surface, of staking claims and of taking away assay or display samples, and no mining or realization is permitted until they are converted into leases. In New Zealand they confer full mining rights for gold, but not for any other metal. In Tasmania the right to excavate and sell ore found can only be secured by taking out an additional license called a "Miner's Right," which costs five shillings per year and is indefinitely renewable annually at the same cost.

All claims are transferable after recording, and the acts of

staking and recording are simple, effective, and inexpensive, excepting in Victoria and New Zealand, where they are rather elaborate, and in New South Wales, where they are rather expensive from the point of view of the miner.

Leasehold terms range from 15 years (renewable indefinitely) in Victoria, to 63 years in New Zealand, and are good only for the metal or metals specified in the document, excepting in Tasmania, where they are good either for gold alone, or for all other metals except gold.

Claims and leases are maintained in force by the annual payment in advance of a rental ranging in amount for the precious metals from zero per acre in New Zealand and one shilling in South Australia, up to one pound per acre in Queensland, and smaller amounts for the other metals, except in New Zealand and Victoria where, curiously enough, the rates are higher for the base metals.

British Australasia has never had to contend with a native population of assumed intellectual inferiority as has South Africa. The Australian and Tasmanian aborigine, like the red Indian of America, would not work; while the New Zealand native, being a Polynesian of the best class, was not only a good worker but proved to be so close to the white man in color and intelligence that no invidious distinction has arisen between them. It is therefore not beneath the dignity of the Briton there to work with his hands, and labor is no more the badge of a caste there than in America or Canada. Hence, if the mining laws permitted the free exercise of that line of activity which has to do with the search for deposits of the metals, and gave the discoverer the chance to enjoy the normal reward of his labor, prospectors would surely be attracted by the great opportunities offered.

NEW SOUTH WALES

(Law of 1906 with amendments to January 1st, 1917)

A Prospecting and Mining License is required. The document is known as a "Miner's Right." It costs five shillings per year,

and is renewable annually up to a total of 20 years. Any number may be taken out by an individual of legal age if capable of citizenship. Each license is good for the location of one claim of each of the nine classes recognized by the law, as hereinafter specified, is transferable by endorsement, and confers possessory title to all claims acquired by virtue of it, as long as it is kept in force, and as long as the Rules and Regulations of the Mining Acts are complied with and provides for the exercise of all necessary rights of mining activity thereon and therein; also of locating one residence area (with surface rights only) not to exceed one-quarter of an acre if within the boundaries of a town, or two acres if outside.

The Law recognizes the following classes of claims, all of which are called "tenements:"

Class 1.

Alluvial Prospecting Areas	600 by 600 to 1400 by 1400 feet
Quartz Prospecting Areas	400 by 480 to 400 by 960 feet
Mineral Prospecting Areas	1320 by 1320 feet
Opal Prospecting Areas	400 by 400 feet

Class 2.

Alluvial Reward Claim	300 by 300 to 700 by 700 feet
Block Alluvial Claim	100 by 100 to 300 by 300 feet
Extended Alluvial Claim	147 by 590 to 233 by 933 feet
Sluicing Claim	180 by 722 to 233 by 933 feet
River and Creek Claim	100 ft. by width of creek.
Quartz Reward Claim	240 by 400 to 400 by 480 feet
Ordinary Quartz Claim	60 by 400 feet
Mineral Reward Claim	600 by 660 feet
Opal Reward Claim	150 by 150 feet
Ordinary Mineral Claim	417 by 417 feet
Ordinary Opal Claim	100 by 100 feet

Class 3.—Water Rights Claim. No specified area.
Class 4.—Dam (Reservoir) Site. Five acres.
Class 5.—Races (Ditches). Ten to 20 feet on each side of channel.
Class 6.—Machinery Areas. Two Acres.
Class 7.—Road Claims. Not over 15 feet wide.
Class 8.—Tramway Claims. Not over 15 feet wide.
Class 9.—Tunnel Sites. As per agreement with Warden and Minister.

A holder of a "Miner's Right" may make application for authority to prospect on any unoccupied Crown lands to the Minister of Mines, who thereupon will arrange terms of area, time, rental, conditions of labor and all other necessary matters with applicant, and will issue exclusive authority. Rental, and survey fee (if necessary) are payable in advance. Upon the discovery of any desirable mineral within the area so granted, the discoverer must report within 14 days to the District Warden, who thereupon reports to the Minister of Mines. The latter then, at his discretion, calls upon the discoverer to take out a lease, or will allow him to continue his prospecting operations for a longer period.

On all classes of claims except prospecting areas, block claims, and residence areas outside of towns, registration is required within 28 days after the act of taking possession. It is effected at the office of the Mining Register of the district in which the property lies. At this function the "Miner's Right" must be produced. After registration, conveyancing rights are complete.

On all classes of claims except prospecting areas, block claims, and residence areas, the act of taking possession consists in setting stakes at all corners of the claim, one of which is called the "datum" stake. On this, within three days after staking, the claimant must post a notice giving his name, date of location, class of claim, area and shape. Simultaneously a copy of the same must be posted on the outside of the office of the Registrar, and both notices must be kept posted until registration is effected. Adverse claimants have seven days after this act of posting in which to file adverse claims.

Registration fee for all classes of claims is 2s. 6d.

Registration is obligatory on the following classes of claims, Alluvial Reward, Extended Alluvial, Sluicing, River and Creek, Quartz Reward, Ordinary Quartz, Block Alluvial, Mineral Reward, Opal Reward, Water Right, Ditch Right, Reservoir Site, Machinery Site, Road, and Tramway. All others may be registered, if claimant so desires.

Surveys, at cost of claimant, at the time of registration, are

obligatory on the following classes of claims: Alluvial Reward, Alluvial Extended, Sluicing, Quartz Reward, Ordinary Quartz, Mineral Reward, and Machinery Area. On other classes of tenements surveys are at the option of the claimant. But a survey can always be insisted upon by the authorities, and when not, an Inspection Fee of 10 shillings ($2.50) is substituted. Survey costs range from $5 on claims not exceeding one acre in area, up to $50 on claims not over one square mile in area.

Upon prospecting areas at least one competent miner must be efficiently employed daily (except on legal holidays) to maintain the claim title.

Mining and prospecting claims may be located on privately owned lands by permission of the District Warden, and upon payment to the surface owner of such an amount as the Warden may decree. But no such permission will be granted upon lands covered with buildings or reservoirs, or in cultivation, without the consent of the owner.

Residence areas cover only surface rights, and to the depth of 50 feet thereunder.

The title acquirable through the exercise of the "Miner's Right" is of a possessory nature only, and is maintainable only by keeping the "Right" in force, and by keeping efficiently at work on the claim to the satisfaction of the District Warden. It may be converted at any time into a lease, and the authorities have the right to insist upon the conversion.

Quartz Prospecting Areas, Quartz Reward Claims, and Quartz Ordinary Claims are supposed to be located only on well defined veins or lodes in which gold is the principal metal expected to be recovered.

Mineral Prospecting Areas, Mineral Reward Claims and Ordinary Mineral Claims are supposed to be located on all other kinds of underground metalliferous deposits.

Leases

All leases are grantable or refusable at the discretion of the Governor-in-Council.

Survey is required (at cost of applicant) unless the ground has been already surveyed, and all the monuments are in good order.

The maximum area for a gold mining lease is 25 acres.

The maximum area for a mineral lease for other metals is 80 acres.

The maximum area for an opal lease is 10 acres.

Rental for leases of all kinds is five shillings per acre, per annum, payable in advance.

All leased areas must, if practicable, be parallelograms, with lengths not greater than three times the widths.

The maximum term of a lease is 20 years, which may be renewed once for a second term of equal length.

All leases are liable for forfeiture if the holder mines thereon for metals other than that or those for which lease was granted.

All conditions of a lease otherwise are matters of arrangement between the applicant and the Minister of Mines, duly advised by the District Warden.

Special forms of leases, to cover special conditions not specified in the law, are obtainable through negotiations with the Minister of Mines. When application is made for same a fee of £10 is required, in addition to the rental in advance.

Preliminary authority to enter privately owned land for prospecting purposes is granted for any term not to exceed 12 months, with right for an extension of an additional 12 months if desired.

When leases are asked for and obtained on privately owned land, in addition to the rental due to the Government a second rental, payable quarterly in advance, is due to the surface owner, the amount of the same to be determined by the district Warden.

Labor requirements on leases are as follows:

For gold claims, not less than one man per five acres (or fraction) for the first 12 months; and thereafter, not less than one man per two acres. For other metals, not less than one man per 20 acres for first 12 months, and thereafter not less than one man per 10 acres.

Leases for dredging purposes are obtainable for terms of 20 years, renewable once for an equal term, at an annual rental of

2s. 6d. per acre, payable in advance. If on privately owned land, on a rental to be approved by the Warden.

Royalties

On all classes of claims, whether on public or private land, and for all kinds of metals, royalty is required of 1% of the gross value of the metal recovered, less the amount of rental annually paid. No royalties are payable to surface owners.

All producers must keep books of account, and must report fully as to their operations between January 1st and 14th of each year for the year passed. Further reports may be required at any time. Full inspection by Government officials at any reasonable hour must be allowed.

NEW ZEALAND

(Law of 1908, with amendments to date of January 1st, 1917)

All Crown lands not already occupied for mining or other purposes are open to application for mining privileges; also all lands sold under the Act of 1908 known as "The Land for Settlement" Act; also all land disposed of in any way under the Land Act of 1892 or amendments thereto. But the Governor has the power, from time to time, and after due notice in the official Government Gazette, to withdraw any portions of the Crown lands from mining privileges.

Prospecting is not free. A form of permit called a "Miner's Right" is required to be in the possession of all who engage in the business on their own account. Such permits, good for 12 months from date of issue, may be purchased by any individual of either sex over the age of 14 years, and in any desired number, at a cost of five shillings each (except in the case of permits giving rights on Native ceded lands,when the cost is 20 shillings), from any Postmaster or District Warden. They are not transferable. They confer the right to take up one alluvial claim, and to buy any number of such from legal holders thereof; and to prospect on Crown lands (or on Native ceded land if the "Right" is of that

kind) for any metal or mineral. The law also provides for the sale to anyone legally entitled to purchase one or more single "Miner's Rights," a permit called a "Consolidated Miner's Right," which consists of any desired number of single "Miner's Rights," and costs a sum equal to the aggregate of the cost of all the "Rights" therein. When such a document is taken out for the benefit of a mining partnership, the name of each partner must appear upon it; otherwise, only the name of the actual purchaser. This also is good for twelve months only. Both of these forms of permit may be renewed annually indefinitely, at the same cost as that of the original issue.

Two other forms of prospecting permits are obtainable, one of which is called a "Prospecting Warrant," and the other a "Prospecting License." These, when covering privileges on Native ceded land, are issued only by the Governor, and when on other lands, by the District Wardens, and at their discretion. The "Warrant" is a non-exclusive right, while the "License" is an exclusive one, covering rights only on the particular area described by it.

Again, these "Prospecting Licenses" are of two kinds, called respectively "Ordinary Prospecting Licenses" and "Tunnel Prospecting Licenses." The former applies to prospecting generally, and the latter to prospecting along the line of a tunnel which the licensee is driving.

When a "Prospecting Warrant" is used, no staking of claims or areas is required, but when operating under a "Prospecting License" the ground must be staked, and a survey may be required if two or more individuals are operating close together.

The area of land to which a "Tunnel Prospecting License" may relate cannot exceed 450 feet on each side of the center line of the tunnel along the whole length thereof, but in no case can it include any river, or river channel. The area pertaining to an "Ordinary Prospecting License" is 100 acres or less.

The "Prospecting Warrant" and "Ordinary Prospecting License" are good for 12 months and are not renewable; but on their expiry the holder may make a fresh application. A "Tun-

nel Prospecting License" has a life of two years, and may be renewed thereafter from year to year indefinitely.

The cost of a "Prospecting Warrant" is 20 shillings, and of an "Ordinary Prospecting License" one shilling per acre of land to which it relates, but in no case not less than 20 shillings. In both cases the fee is payable in advance, and in the case of a "Tunnel Prospecting License" annually in advance, while the license or its renewal is in force.

Prospecting permits, warrants, and licenses of all kinds are issued under the condition of vigorous and practically continuous prosecution of exploration to the satisfaction of the District Warden, to whom also must be reported promptly all discoveries made; also the filling up of all excavations made that are not to be used in the permanent working of the ground. When operations are to be carried on upon privately owned land, satisfactory security must be given to the Warden or Governor to cover any damages that might ensue. Areas exempted from prospecting are those enclosed and cultivated or used for residential purposes, cemetaries and parks (public and private); privately owned areas whose owners are themselves conducting explorations for mineral, or are mining; and within 100 feet of any spring, artificial reservoir, dam, ditch or water works.

Still another form of prospecting permit is obtainable, which is called a "Mineral Prospecting Warrant." It may be secured from the District Warden, or the Commissioner of Crown Lands acting under the permission of the Minister of Mines. It grants exclusive right to search for any one specified mineral over a definitely delimited area of Crown land not to exceed 10,000 acres in extent, is good for five years, and costs £50 for the first 1000 acres, and £25 for each subsequent 1000 acres or fraction thereof, payable in advance. In addition, an annual rental of one penny per acre for the first and second year, twopence for the third, threepence for the fourth, and sixpence for the fifth. At any time within the term the Warrant may be converted into a lease for not to exceed 1000 acres in one contiguous block, on payment of £1 per acre. The term is 63 years or less, and the

rental is 2s. 6d. per acre per annum. In addition, a royalty of 4% of the value of the mineral at the mine is collected. But, when the royalty in any one year exceeds the amount of the rental, the latter, for that year, is remitted.

All forms of prospecting permits heretofore mentioned, excepting the one called "Mineral Prospecting Warrant," are assumed by the law to be utilized only for searching and exploring, and do not convey the right to produce metals or ores, or to realize on the same in any way. But when such substances are found, and appear to exist in payable quantity, the prospector is supposed at once to file claims upon his discovery, and to have the exclusive right to do so. Claims are of five kinds, to wit: Alluvial, Dredging, River, Quartz, and Sea Beach.

In general, and when not impracticable, all claims must be four-sided (but not necessarily rectangular), with no one side exceeding twice the length of any other side. When this rule is impracticable or unreasonable, it may be set aside with the consent of the District Warden.

Each one of the above mentioned classes of claims may be of three kinds, to wit: Ordinary, Extended, and Special.

Ordinary claims are generally one acre or less in area, but in each case to which they apply there are numerous exceptions, provisos and variations, depending for the most part on local topographic conditions, and also to a minor degree on the classification of land upon which the claim is located; that is, whether it be Crown, Native, Native ceded, Private, or Reserve.

Extended claims are generally five acres or less in extent, with also several exceptions and variations.

Special claims may be of any size, up to 100 acres.

In all these cases the applicant for ground may locate any area desired so long as he does not exceed the above mentioned maxima; and also as many of them as may be represented by the "Miner's Rights" he holds.

In staking, substantial posts or piles of stones must be set at each corner, and trenches dug, or finger posts set up on each stake indicating the direction to the next corner.

Labor requirements for the maintenance of title to claims begins very shortly after the act of staking; within 48 hours in the case of the Ordinary Alluvial, within 14 days in the case of an Extended Alluvial, and in the case of a Special claim within the period set by the Warden in granting it. In regard to amount, at least one legal shift (eight hours) per 24, per legal working day, must be applied on Ordinary and Extended claims, and at least two shifts on Special claims. Numerous conditions, such as acreage and age of claim, and class of land upon which it is filed, increase the amounts required. On Mineral Prospecting Warrants work must begin within three months from date of issue, and at least the labor of two men for one legal shift per legal working day per 100 acres of area is required. On Mineral Leases work must begin within six months. During the succeeding 18 months at least one workman per 10 acres per legal working day is required; thereafter, two workmen per 10 acres.

The registration of Ordinary claims does not seem to be obligatory, but the transfer or conveyance of a part or all of such a privilege is not legal unless registered, and registration of the same will be refused unless the privilege itself is registered. Consequently, it is the general custom to register very shortly after the receipt by the claimant of the certificate which evidences them. Registration fees are moderate.

As soon as Ordinary claims are staked, and all provisions of the law in relation thereto are complied with, the production of gold therefrom may begin, and may be continued indefinitely thereafter without payment of fees, dues, taxes, royalties or any government imposts of any kind, so long as the title is kept valid by the annual renewal of the "Miner's Right" on which it is based, and the performance of the labor conditions prescribed by the Regulations that are from time to time promulgated by the Minister of Mines and his subordinate officials. But no other mineral or metal than gold may be recovered or taken possession of.

On Extended and Special claims an annual fee per acre or fraction thereof is due and payable in advance, which varies from

one shilling to 7s. 6d., according to conditions determined mainly by the age of the claim, and the status of the land on which it is located.

Ample regulations exist in the law for the acquisition of water and timber-cutting privileges, mill, smelter, residence and workshop sites, and for all other purposes properly pertaining to the occupation of mining, and on reasonable terms.

A mining claim is considered to have been abandoned if the rent, royalty or license fee is in default for twelve months; or when for any continuous period of one month it has been entirely unused for its proper purpose; if there are buildings and machinery upon it, the period is three months.

All mining privileges are regarded legally as chattel interests, and may be sold, incumbered, transmitted, seized under writ for execution, or otherwise disposed of.

No royalty, rental, claim license or other dues are imposed by the State on the production of gold.

On the other hand, no form of mining privilege capable of being issued under the law permits the holder thereof to mine, produce, take possession of, or realize upon any other metal or mineral that may be found, unless the privilege under which he is operating specifically grants the right to mine the same; and further, until that right has been embodied in a lease from the State, issued from the office of the Minister of Mines, and in the form and under the conditions prescribed by the law, and amendments thereto.

Any form of prospecting license may be converted at any time into Mineral Licenses giving the right to work for a specified metal or mineral other than gold.

A Mineral License cannot exceed 320 acres in area, and the rental is 2s. 6d. per acre per annum in advance. The government also reserves the right to impose a royalty that may not be less than 1% nor more than 4% on the value of the product at the mine. But all sums paid as royalty in any one year may be applied as a reduction of the rental due at the beginning of the next year.

QUEENSLAND

(Law of 1898, with amendments to January 1st, 1917)

The State claims the exclusive ownership of gold wherever found within its territory; and of silver, except on certain tracts alienated in accordance with the provisions of Sec. 22 of the Crown Land Alienation Act of 1860, with Sec. 32 of the Crown Land Alienation Act of 1868, and with Sec. 21 of the Mineral Lands Act of 1872; also of Copper, Tin, Opal and Antimony, excepting on lands alienated in fee simple prior to December 29th, 1909. Coal, on public lands, and also on lands subject to the "Agricultural Lands Special Purchase Act" of 1901 is also exclusively the property of the State. Finally, all other metals and minerals occurring on public land or on private property, excepting where the latter has been alienated in fee simple prior to December 29th, 1909, are the exclusive property of the State.

The State will not sell its mineral rights, but does allow the filing of mining claims upon them, and protects such locators while prospecting and development work is being conducted thereon, and when such claimants are ready to begin production it provides for the conversion of their claims into leases for given terms of years, at stated rentals and royalties as hereinafter detailed.

Prospecting is not free. A license, called a "Miners' Right" is required. This document is issued to any individual not of Asiatic, African, or Polynesian birth or ancestry, for any period up to 10 years, on payment of a sum at the rate of five shillings for every year for which the license is to be in force. It is not transferable. Any number of these may be purchased by an individual. Another form of the same document, called a "Consolidated Miners' Right," is purchasable by individuals, partnerships, corporations, etc., good for any part or the whole of said maximum term, and costs a sum per year of the term equal to the number of names upon it multiplied by five shillings.

A holder of either one of these forms of "Right" has the privilege of prospecting and exploring on public land, locating claims

and mining thereon; also of acquiring mining property under lease direct, or by purchase from others, or of converting claims into leases; all this, however, only when operating strictly in accordance with the provisions of the law, and the regulations thereunder.

When mining claims and leases are so acquired, registered, and maintained in force, conveyancing rights on the same are complete, except that the grantee in each case must also be the holder of a Miner's Right or of as many of them, in single or consolidated form, as the number of claims to which the title is passed.

All property acquired by virtue of a Miner's Right is deemed to be a chattel interest, in the common law meaning of the term.

Miner's Rights are renewable at the date of their expiry on the same terms as those upon which they were first purchased.

From all mining claims properly located and maintained, and from all mining leases secured, the holder thereof is entitled to the absolute possession of all gold and other metals (precious or base) and minerals, recovered and won therefrom in legal and proper ways.

However, as a necessary antecedent to the location of claims on public land, the region must be a proclaimed goldfield, from which rule there is no variation, except in the case of the first discovery made upon unproclaimed land.

When such a discovery is made, the discoverer is required to report the same in writing at once at the office of the nearest District Warden, and such report, when posted on the outside of the office of the Warden, has the effect of a temporary or provisional proclamation of a goldfield in the shape of a square area, the boundary lines of which run towards the cardinal points of the magnetic compass, the sides being each a mile in length and so placed as to locate the discovery in the approximate center of the area. But before posting such notice the Warden must examine the find, and decide whether it is of sufficient importance to warrant such a provisional proclamation, and it is within his power to refuse the posting. If it is allowed, the matter goes to

the Minister of Mines who, at his discretion, may accept the decision of the Warden, and formally proclaim the area, or he may defer action until he, or some officer appointed by him for the purpose, has examined and reported upon the discovery. If this report is unfavorable, the provisional proclamation is formally cancelled and the claim of the discoverer disallowed. If it is favorable, the region is formally proclaimed a Public Digging.

It is in the power of the Governor to pay to the recognized discoverer of a new goldfield, a cash reward of £500, if the discovery is located 20 miles or more from any other workings, and if there are at work there, within four months after the discovery, 200 or more miners. Or, if there are 500 miners at work there at the end of six months, the reward is £1000.

A holder of a Miner's Right may locate and operate any desired number of unit claims, so long as the same are worked as prescribed by the law and the regulations thereunder.

The process of location consists of setting substantial posts or monuments at each corner, and the cutting of direction trenches at their bases. Registration is obligatory within seven days of staking. Work must begin within seven days thereafter.

The sizes of prospecting areas for gold are as follows: If outside the limits of a proclaimed Public Digging, 400 yards square. If within such limits and distant three miles or more from the nearest operating mine, 300 yards square. If distant from one to three miles, 200 yards square. If distant between 400 yards and a mile from the same, 150 yards square. No prospecting area is allowable nearer than 400 yards to an operation mine.

The sizes of prospecting areas for any metal or mineral other than gold or coal are as follows: If outside of the limits of a proclaimed mineral field, 160 acres. If within such limits, and distant 10 miles or more from the nearest operating mine, 40 acres. If distant between five and 10 miles, 20 acres. If distant between one and five miles, 10 acres. No prospecting area is allowable within one mile.

All such prospecting areas must be staked off as a square block,

with substantial posts at each corner, and at a conspicuous point within the lines a notice must be posted giving name or names of claimants, the number and date of their Rights and the date of location. Registration must take place within seven days, and must be renewed monthly. Such re-registration, however, may be refused at the discretion of the District Warden, who may in lieu thereof demand that the prospectors stake off a claim or claims, or take out a lease.

Labor requirements on a prospecting area of either kind are the labor of not less than one man for one legal shift (eight hours) per legal working day, Sundays and holidays excepted.

Report of the discovery of payable ore must be made within 14 days, whereupon the Warden must examine the prospect as soon as possible, and if in his opinion it is promising, he is authorized to allot the proper number of claims to the discoverers, and also, in addition, a prospecting claim of dimensions varying in size in accordance with his view of the comparative importance of the find. If on such claims minerals other than gold or coal are found they must be reported to the Warden within 14 days, who, after examination, if in his opinion the discovery is of sufficient importance, will allot a mineral prospecting area to the discoverer or discoverers, and register the same in their name. Labor conditions on such areas are the same as on a gold prospecting area.

The size of an ordinary gold-reef claim is 50 by 400 feet, the first dimension to be laid off along the strike of the reef. The tract must be rectangular in shape, and such part of the width as the locator may desire may be laid off on either side of the line of strike. Ten of such claims, adjoining, may be taken up as a block by an association of names, each being the holder of a Miner's Right. Until such a claim or block of claims has become payable, the labor conditions affecting maintenance are the same as hereinbefore stated. When production begins the requirement is the labor of one man per legal day, per 50 feet along the reef. Registration is obligatory within seven days after staking. There are no extralateral rights.

The unit alluvial claim is a rectangle measuring 100 by 50 feet, but in wet or rocky ground where shaft sinking is necessary the unit is 100 by 100 feet. All such claims are to be registered as soon as their boundaries are defined to the satisfaction of the Warden. The labor requirements are one shift per legal working day. Various other sized claims of the alluvial class are specified by the law as allowable, such as river or creek, puddling, auriferous sand, prospecting, extended hydraulic, dredging, amalgamated, etc., some depending upon the method of operation, and others upon topographical conditions, nature of gravel, etc. All require registration and labor conditions similar to those already mentioned. In the case of dredging areas a rental of 2s. 6d. per acre per annum is required, payable in advance.

The law also makes ample provisions for water, ditch, and reservoir sites, for machinery, tramway and tailings areas, and for business, residence and garden tracts. For all of these an acreage rental is payable in advance in various reasonable sums. Registration of all such claims is obligatory, and surveys at the claimant's expense may be required by the Warden.

Leases

The conversion of claims into leases is not obligatory, but is desirable and is generally effected as soon as it becomes evident that the property has become valuable. These franchises are of two kinds, namely, Gold Mining Leases and Mineral Leases.

The Gold Mining Lease confers the right to work for gold only. Its area cannot exceed 50 acres, and its term 21 years, renewable once. The rental is £1 per acre per annum in advance. There are numerous exceptions and provisos to these standard figures depending upon various conditions. Maintenance is based upon reasonably continuous usage, and compliance with the prescribed regulations of the law.

The Mineral Lease conveys the right to work only for such metals or minerals as are specified in the document, and its details are largely a matter of bargain between the applicant and

the government officials in charge of the business, excepting as to certain fundamentals, such as the area, which cannot exceed 160 acres (except in the case of coal mines where a larger grant is made); the term, which is 21 years with the right of one renewal of equal length; and the rental, which is 10 shillings per acre per annum, payable in advance, excepting again in the case of coal, where a lower rental is provided.

No Mineral Lease covers the production of gold. If that metal is found, and it is the desire of the leaseholder to work for it in connection with any other metal that he may be producing, a special license to that effect must be procured. The same rule also applies to any other metal or mineral that may from time to time be found, other than those specified in the contract. In the case of gold, when recovered from the ores of a mineral lease, the government imposes a royalty of 1% of the gross value of the output of that metal.

Mining on Private Land

No mining is allowed on improved private land, nor within 150 yards of the same; nor if it is less than one-half an acre in area and lies within the limits of a township, unless the consent of the owner is obtained, and unless the right granted exempts the surface and a certain distance below it (as arranged by the Warden) from all operations.

To enter any private land for purely prospecting purposes, a written permit must be obtained from the Warden. Such a permit may be given for an area not to exceed 640 acres, for a term not more than 30 days, and in consideration of a deposit of 20 shillings to compensate the owner for possible damage to the premises during the search, which must be confined simply to looking over the surface. This sum is returnable to the permit holder if no damage occurs, otherwise it is payable in whole or in part to the owner of the land. Only one such permit is obtainable at the same time for the same tract of land, and it cannot include more than five individuals. If for any reason

the Warden declines to issue the permit, appeal may be had to the Minister of Mines.

If, after searching over the area covered by such a permit the holder or holders thereof desires to acquire mining rights thereon, notice must first be given to the surface owner or his Agent, or if the land is unoccupied and its owner cannot be located, a notice must be conspicuously posted upon the tract desired, which must be staked out as in the case of a mining claim. Written application for it, together with an accurate description of its metes and bounds, is then filed with the Warden who, if it is approved, and no objections are lodged within a short period, will grant a lease, which must at once be registered. Thereafter the leased area must be operated strictly in accordance with the terms of the mining law and regulations. This area and conditions are identical with those prescribed for leases on public lands.

SOUTH AUSTRALIA

(Law of 1893, with amendments to date of January 1st, 1917)

The Province opens to the prospector and miner its entire territory, except areas alienated previous to 1886 for gold, and except areas alienated previous to 1888 for all other minerals and metals.

A prospecting license, called a "Miner's Right" is required, which must be kept in force indefinitely by all who desire to continue holding mining property. The initial cost is five shillings per annum, and renewal cost the same. It covers all metals and minerals, but is good for the location of one claim only. However, any desired number may be held by an individual, except that no person may hold by virtue of them more than one alluvial claim at one time, although he may hold by purchase as many as desired.

Three kinds of claims are recognized, viz., Gold Claims, Mineral Claims and Coal Claims. Details of the last, which includes also Oil, Natural Gas, Salines, etc., will not be given.

Gold Claims are of two kinds, namely Alluvial Claims and Reef Claims. The former covers the right to operate only the loose surface soil, or gravel, or cement; while the latter covers operations in seams, lodes, veins, deposits, etc., in rock in place. Both carry the right to own and produce any other metal or mineral found in mechanical or chemical association with the gold.

The standard Alluvial Claim is 30 feet square, and is called a "one man claim," but a prospector who is seeking new ground is allowed to stake off what is called an "alluvial prospecting area," and to hold exclusive prospecting rights in it while testing it, but no longer. This area varies in size according to its distance from the nearest occupied and operating alluvial area as follows:

If distant 100 yards or more.....	100 yards square.
If distant one mile or more.....	150 yards square.
If distant three miles or more.....	500 yards square.

When gold, or any other desirable alluvial metal or mineral, is found on such a "protected" area, the discoverer is entitled to stake out, inside of the area, in addition to the one claim 30 feet square that his license calls for, additional claims as follows, according to the distance of the new discovery from other occupied and operating areas:

If distant half a mile.....	3 claims, each 30 feet square.
If distant one mile.....	4 claims, each 30 feet square.
If distant two miles.....	6 claims, each 30 feet square.
If distant three miles or over...	10 claims, each 30 feet square.

If the ground is very wet, and shafting is required to reach the pay streak on the bedrock, at the discretion of the district Warden claims 30 by 60 feet may be allowed. If the gold occurs in a cement that must be blasted, the claim size is 36 by 72 feet, while stream or creek claims are 60 feet in length along its course and 120 feet wide.

Reef Claims of the ordinary kind are 100 feet in length along the line of outcrop, and 600 feet wide across it, the locator being allowed to apportion this width in relation to the line of outcrop as he sees fit, so long as it is included. But it must be laid out

as a rectangle. As in the case of an alluvial discovery, a prospector who has found a promising reef outcrop, or indications thereof, and desires time for explorations before actually determining the position of his lines and corners, may stake out a "reef protection area" of double the length of the ordinary reef claim, which gives him exclusive rights therein for three months. Before the end of this period he must decide upon his lines finally. Such a prospector, who has made a new discovery, is allowed to stake out within this protected area, in addition to the ordinary reef claim, what is called a "Reef reward claim," which varies in size according to its distance from the nearest occupied and operating reef claim, as follows:

If distant one to five miles	200 by 600 feet
If distant five to 10 miles	300 by 600 feet
If distant over 10 miles	400 by 600 feet

Alluvial and reef discoveries must be reported within seven days to the authorities, but the protection area may be staked out before complying with this regulation.

Registration must be effected within 30 days of final staking. A suitable blank form is provided for this operation by the Mining Registrar. The prospecting license must be attached to it, and a fee of two shillings and sixpence paid. A certificate of registration is then issued to the applicant, and his license returned to him with the number of the certificate endorsed upon it.

Holders of gold claims have the right to produce any and all other metals and minerals that may be found in mechanical or chemical combination with the gold.

The staking of gold protection areas or claims consists in erecting at each corner a post not less than three inches thick, and projecting not less than three feet above the surface. From each post two trenches must be dug pointing towards the next two corners, each trench to be not less than three feet long and six inches deep. In very rocky ground direction piles of loose stones may be substituted. On each post must be marked the claim number and date of staking.

Any number of adjacent gold claims may be consolidated or amalgamated into a "block," by making application to the authorities accompanied by a fee of three shillings and sixpence.

In addition to keeping the "Miner's Right" in force, a claim is maintained in force only by the labor of one man or more for eight hours during the 24 of the day, except on Sundays, and public holidays, and on Saturdays, when four hours' work suffices. When claims are consolidated into a "block" the labor conditions are somewhat less.

Tailing areas (not exceeding one acre), Tunnel areas (20 feet on each side of its line), Rubbish areas (200 feet square, and supposed to be located at the entrance to a tunnel) and Dam or Machinery areas (not over 4 acres) may be located, and exclusive use thereof secured, at a cost in the first three cases of five shillings per annum, and in the last two of five shillings per acre per annum. There are also simple and inexpensive provisions for water and ditch rights.

Mineral claims may be of any area up to 40 acres, but must be laid out in rectangular form, with lengths not greater than twice their width, and sides orientated magnetically. Such claims carry the right to mine for all metals and minerals *except* gold. When this metal is found in the ore produced from a mineral claim, the owner has the preferential right to locate a gold claim within and on top of his mineral claim, and must do so or lose the right to produce the gold. To maintain title, the claimant, in addition to keeping his "Miner's Right" continually in force, must have two men constantly at work for 8 hours of each 24 (4 hours on Saturdays) excepting Sundays and public holidays.

When ore is discovered in presumably payable quantity, the fact must be reported to the authorities. Registration is prescribed as in the case of Gold Claims.

Leases

All varieties of mining claims may be and are expected to be converted into leases as soon as they become payable (except alluvial claims). The procedure for conversion is simple and

inexpensive. They may be taken out on single claims or blocks of claims, and when such consolidations are effected the work required for maintenance may be concentrated at one or more points at the will of the claimant. The maximum area for a gold claim lease is 20 acres, and for a mineral lease 40 acres. The maximum term is 42 years in either case. The rental is one shilling per acre per annum, in addition to which the Government imposes a royalty of 2½% on the net profits. The working requirements are the labor of at least one man per five acres or fraction thereof, with equitable reductions of this requirement when animal power or machinery is installed.

The maximum area for a single mineral lease is 40 acres, but consolidation into a block may be effected, as with gold claims. The maintenance conditions are the labor of one man per 10 acres during working days. The maximum term is 42 years, and the annual rental and royalty the same as with gold leases. If the mineral found and produced contains gold, a gold lease must also be taken out.

The law provides equitable and inexpensive procedures by which prospecting and mining may be carried on upon alienated land, where the Government has reserved the mineral rights in making the grant, and also for expropriation of areas that prove to be valuable for their mineral contents and where the Government has not reserved its mineral rights in the grant, provided the owner has not already exercised his preferential rights to prospect, explore, and produce.

TASMANIA

(Law of 1905, with amendments to date of January 1st, 1917)

Prospecting is not free. A document called a "Prospecting License" is required by all who engage in the occupation, which costs ten shillings per annum. One may be taken out by any individual over 15 years of age, or by the registered Manager of a registered mining company, or the registered Agent of a mining company that is not registered in Tasmania, or the duly authorized representative of a partnership. It conveys the exclusive

right to prospect for any metal or mineral, on any selected area of Crown land that may be applied for, and to enjoy full protection in the occupation of the same. But it does not give the right to remove or realize upon any substance found while prospecting.

Mining is not free. A document called a "Miner's Right" is required, which costs five shillings per annum, and may be purchased by any individual legally capable of taking out a prospecting license. This confers the right to take possession of, occupy and use one claim upon any public land at the time available under the provisions of the law, and in accordance with its rules and regulations, to mine and produce therefrom, and realize upon any metal or mineral produced, and to do all other acts properly necessary to the business of mining.

The State also issues a document called a "Consolidated Miner's Right," which simply represents any number of single "Miner's Rights," and which costs a sum equal to five shillings multiplied by the number of "Rights" it covers, and confers the same rights and privileges.

Any land duly staked and registered and thereby acquired under either form of "Miner's Right" is held to be a chattel interest under the common law definition of that term, and so long as the "Right" is maintained in good order and the property operated in accordance with the law and regulations thereunder, any gold or other metal or mineral found upon it becomes and remains the absolute property of the holder thereof.

Mining claims cannot be staked off on prospecting areas (except by the holder of the area), nor upon improved or cultivated land, nor upon tracts already occupied by ditches, reservoirs, or wells.

Prospecting Licenses, Miner's Rights and Consolidated Miner's Rights are renewable annually at the same cost as that of their issuance. Any mining tenement (prospecting area, mining claim, or block of claims) is automatically abandoned and forfeited when the license or "right" under which it was located is not renewed at the date of its expiry, or within seven days thereafter.

The size of a prospecting area obtainable under a prospecting license is 20 acres for gold alone, 40 acres for all other metals or minerals (except coal, shale, slate, freestone or limestone), and 100 acres for these excepted substances. But upon the recommendation of the District Warden the Minister of Mines is empowered to enlarge the last mentioned area up to a maximum of 320 acres.

Prospecting areas are acquired by staking the corners of the same in the usual way, and by planting a post in the center of the tract upon which is clearly and legibly written the words "Prospecting Area," together with the name of the claimant, the area of the claim, the date of the staking, the metal or metals or mineral for which search is being made, and the relative position of such post and notice on the tract. This notice must be maintained in good order during occupancy, and a copy of it must be filed for registration at the office of the nearest Registrar at the earliest practicable date. Work must begin within 48 hours thereafter, and continue to the extent of at least the labor of one man during 40 hours per week. If the area has been enlarged by special permit of the Minister of Mines, the labor requirements are correspondingly increased. During tenancy no material of value may be taken away without special permit, except assay samples, and no work other than bona fide exploration for metals or minerals may be done upon it. Finally, if the holder decides to abandon the tract, a notice to that effect must be filed with the Registrar without delay.

The unit mining claim that may be acquired under the authority of a single or consolidated Miner's Right is a rectangle 50 yards square, or the equivalent of about half an acre. Any number of these up to ten may be staked as a block when contiguous, by an association of "Rights" holders, according to the number of individuals forming the association. The process of staking consists of planting substantial posts at each corner, one of which is called the "Datum Post." To this must be firmly affixed a notice inscribed "Miner's Right Claim," under which is legibly written the name of the claimants, the date of location,

and the relative position of the notice to the rest of the tract This must be constantly maintained in good order and condition. In addition, direction trenches must be dug at each corner. Within 48 hours a copy of the notice must be filed with (or mailed to) the nearest Registrar. Within the same period also bona fide work must begin to the extent of not less than the labor of one man per 24 hours per legal working day, per unit claim of the tract.

The registration fee for prospecting areas and single or blocked mining claims is 2s. 6d. In each case the Warden has the right to demand a survey at the expense of the claimant. Survey fees are reasonable. Claimants are entitled after registration to receive from the Registrar a Certificate, which is prima facie evidence of the right of tenancy of the holder. After registration, conveyancing rights are complete, providing the grantee is the legal holder of a sufficient number of "Miner's Rights" to receive the transfer.

Two kinds of leases are granted, called respectively Gold Mining Leases and Mineral Leases. They are issued only by the Minister of Mines with the consent of the Governor. The first mentioned, when on Crown land, conveys the right to operate for gold only. The maximum area is 40 acres, and the term 21 years, renewable once, and the rental is £1 per acre per annum. The Mineral Lease on Crown land conveys the right to operate for all metals or minerals except gold. But if gold is found in and recovered from its ores, the lessee must at once report the circumstance to the Minister of Mines, who may demand that the Mineral Lease be suspended and a Gold Lease substituted. But the lessee has the right to decline surrender on undertaking to pay a royalty of 10 shillings per ounce on all gold recovered. The maximum area for a mineral lease is 80 acres, excepting in the case of coal, shale, slate, freestone or limestone, when it may be as much as 320 acres. The term is 21 years, renewable once, and the rental is five shillings per acre per annum in advance excepting for coal, shale, slate, freestone and limestone, for which the rate is 2s. 6d.

Alluvial leases are obtainable for the beds and banks of streams running over Crown lands. The maximum area is 40 chains along the line of the channel by five chains on each side of the center, and the Governor has the right to reduce these dimensions, or to refuse the application entirely. The maximum term is 10 years, and the rental five shillings per acre per annum.

Applications for leases are filed with the District Warden or the Minister of Mines, and must be accompanied with a deposit of money equal to a half year's rental of the land applied for, plus the surveying fee.

In gold mining leases a sum not less that £10 per acre per annum must be expended by the lessee on the ground in the shape of labor and general improvements. For mineral leases the requirements are the equivalent of two pounds per acre per annum.

All leases must be registered, after which conveyancing rights are complete, but the fact of a transfer must be endorsed on the document itself and by the Minister. Registration fees in general are reasonable. It is not necessary that the applicant for a lease, nor the grantee in the case of the transfer of one, should be the holder of a "Miner's Right."

Ample provisions are made in the law for Water, Ditch, Reservoir, and Timber Rights, for Machinery, Tramway, and Tailings Sites, and for the establishment of Drainage Areas. Also for all necessary easements.

Prospecting licenses may be issued to individuals under the age of 18 years, but not "Miner's Rights."

Mining on Private Land

Written application for a permit to enter must first be made to the Warden. They are granted for periods not to exceed 90 days, and cover such an area as, in his opinion, seems right under the circumstances. The applicant must also deposit with the same official such a sum of money as, in his opinion, is sufficient

to cover possible damage to the premises. This deposit is returnable if no injury results, otherwise it is payable in part or wholly to the surface owner. Such a permit conveys the right merely to inspect the surface of the premises but not to do any digging, or take away anything found except as assay samples. The latter must not exceed 28 lbs. in weight. If, after prospecting, the holder of the permit desires to explore the ground, he may mark out an area, and apply for a lease on the same, at the same time notifying the surface owner of his intentions, and showing him the area selected. He must also post a notice at a conspicuous point on the chosen tract, giving detailed description of the same and supply a copy of this to the district Warden. The area, term, and rental conditions of the lease, if allowed, are the same as those granted for leases on Crown lands.

VICTORIA

(Law of September 16th, 1915, with amendments to date of January 1st, 1917)

The State claims the sole and exclusive ownership of the precious metals (gold, silver and platinum), whether existing on the public domain, or on privately owned property, except where, in the deed of grant for the latter, the mineral rights have not been reserved; also of all other metals and minerals, except in privately owned property. The State does not give a fee simple title to any mineral land, but allows the location of claims and prospecting areas, and the temporary possession of them for prospecting and developing purposes, under the regulations of the law, and then requires the conversion of the same into leases, under which production may take place. But in the case of alluvial claims, production may begin immediately after staking and registration, and leases are not necessary.

Prospecting is not free. A license is required. The document is called a "Miner's Right." An unlimited number of these may be taken out by any individual of either sex, if of legal

age and status. Each "Right" costs two shillings and sixpence per annum, and may be taken for any period up to 15 years. Each is good for the location of one mining claim, and also one residence site and water right.

The following varieties of claims may be located:

1. Ordinary Quartz Claim. 100 feet along the line of outcrop, by 600 feet in width, with ownership also of all the alluvial on the surface.

2. Quartz Prospecting Claim. 400 feet along the line of outcrop, by 600 feet in width. But such a claim must be at least 1500 feet distant from any other claim on the same reef or lode.

3. Quartz Prospecting Area. 1500 feet square, but must be distant at least two miles from the nearest operated mine. This variety of claim may be held for 12 months only, and one or more men must be kept at work upon it on legal working days. Such an area does not confer the ownership of any alluvial deposits that may occur upon it. When reef gold is discovered within its lines the claimant is under legal obligations to convert it into a lease as soon as it becomes evident that the proposition can be worked at a profit. The maximum area that will then be granted is 800 feet along the outcrop by 600 feet in width.

4. Quartz Tunneling Claim. Any holder of an Ordinary Quartz, a Quartz Prospecting, or a Mineral Claim may also take possession of an area outside of and beyond his claim for a tunnel site. The maximum size for this class of claim is 3000 feet by 12 feet on either side of the center line of the tunnel, together with a tract 300 by 120 feet at the entrance.

5. Alluvial Claim. There are ten kinds of this order of claims, depending upon various conditions such as topography, depth of gravel and bed rock, distance from other claims, etc. All must be of rectangular shape when practicable, with length no more than three times their width. As to size, they vary from 75 by 100 feet to 23 acres.

6. Mineral Claim. Three acres in size. But an association

of ten individuals, each holding a Miner's Right, may take up a tract not exceeding 30 acres in extent.

7. Mineral Prospecting Claim. Allowable area five acres, but it cannot be located nearer than one mile from a mineral claim. Term of occupancy 12 months. Upon discovery of payable ore it must be converted into a three-acre mineral claim.

On all these varieties of claims the act of taking possession consists of erecting substantial posts or stone monuments at each corner, with trenches three feet long and six inches deep at the base of each, and pointing towards the next corner. Registration is required within seven days thereafter. Upon registration the Registrar delivers to the claimant a notice, in specified form, which must be posted at a conspicuous point on the claim within the next seven days, and maintained there for the following seven days. At the expiration of the last term, if no objection to the registration has meantime been filed with the Registrar, the latter delivers to the claimant a Certificate in a specified form, which is prima facie evidence of title. A survey is not obligatory, but is considered desirable. Surveying costs and registration fees are moderate. After registration, conveyancing rights are complete.

The law makes satisfactory provisions for water rights, and for machinery, residence, and business sites.

All claim titles are maintained in force by labor, which must begin within fourteen days after registration, and thereafter must be continuous on legal working days. Details are as follows:

For Ordinary Quartz Claim, one legal shift (eight hours per 24) per day, per each 100 feet along line of reef, if the mine is in pay. Half that amount if it is not.

For Quartz Prospecting Claim, one shift per 400 feet of reef, or two shifts per 600 feet.

For Ordinary Alluvial Claim, one shift for each unit area of 75 by 100 feet, if the operations are in shallow ground (under 40 feet). Half that number during the first two months of opera-

tions. There are fourteen modifications of this requirement, depending upon depth to bed rock, nature of claim, distance from other workings and other considerations.

Corner stakes, trenches therefrom, and other landmarks required by the law, together with all notices posted thereon, must be continually maintained in good order and repair.

The "Miner's Right" must be kept on hand and available at all times, for inspection visits from the authorities.

Each "Miner's Right" carries with it the right to locate, own, and occupy a residence site, rectangular in shape, and in size ranging from one-quarter to one acre, according to whether it is within the limits of a town site, or near one, or adjoining the claim.

There is no obligation to convert claims into leases, but it is usually found advantageous to do it as soon as the property is proven to be of value.

Leases are of two kinds, namely, Gold Mining and Mineral. The former carries the right to work for gold only, the latter to recover any other mineral or metal. The maximum area for both kinds is 640 acres, and the maximum term 15 years, renewable indefinitely. The rental for the former is 20s. 6d. per acre per annum, and for the latter from one shilling to 20 shillings per acre per annum at the discretion of the Minister of Mines.

To obtain leases, formal application must be made to the Governor, who has the right to refuse to grant them under certain conditions, and, when allowing them, to specify and demand all terms thereof. In each lease the particular metal or mineral that is expected or desired to be worked for must be specified. If thereafter other metals or minerals are found and desired, a license to work for them must be procured from the Minister of Mines. The labor conditions for maintenance of title are largely a matter of bargain between the applicant and the Governor-in-Council, when applying for the lease.

The State imposes no royalties of any kind on the production of any kind of metal or mineral.

WESTERN AUSTRALIA

(Law of 1904, with amendments to date of January 1st, 1917)

The State asserts its exclusive ownership of gold, silver, and other precious metals, upon all land within its boundaries, whether alienated or not, and whether these substances occur on the surface or underground; also to all other metals or minerals on, in, or below the surface, excepting where these latter exist on areas alienated in fee simple prior to January 1st, 1899.

Prospecting is not free. A document called a "Miner's Right" is required to be held by all individuals, partnerships, or corporations who desire to engage in searching for mines. This costs five shillings per year, and is renewable indefinitely at the same price. Any desired number may be purchased and held by one individual, and each one is good for the location of one claim on the Public Domain. Every holder of a "Miner's Right" who desires to prospect on alienated land, can obtain from the district Warden an additional permit, without extra cost, but good for 30 days only, which gives the right to enter upon such areas and prospect; provided, however, that he furnishes to the Warden an indemnity bond sufficient in amount to reimburse the surface owner for any damage his activities may cause.

The "Miner's Right" and any such additional permit as may be issued under it, confers simply the privilege of walking over and critically examining the surface, detaching and taking away assay hand samples of outcropping rocks, and testing gravel with the pan, but does not allow of the disturbance of the surface by digging or making excavations of any kind. Claims also may be staked out, but no exploring work may be done upon them until they have been approved and registered.

The law recognizes three classes of unit mining claims, called respectively "Alluvial," "Alluvial Extended," and "Reef" Claims. Their dimensions vary according to the substance they are supposed to contain, and also according to the number of locators or miners in the partnership at the time of staking.

What is known as a "One Man's Claim" of the various kinds, has the maximum dimensions shown in the following table.

	Alluvial	Alluvial extended	Reef or lode
Gold, silver, platinum.....	75 × 75 ft.	150 × 75 ft.	75 × 390 ft.
All other metallic minerals.	300 × 300 ft.	600 × 300 ft.	150 × 390 ft.
Non-metallic minerals....	375 × 300 ft.	900 × 300 ft.	225 × 390 ft.
Precious stones.....	150 × 150 ft.	300 × 150 ft.	150 × 390 ft.

In each case the first dimension given is called the "length" and the second the "width."

Claim partnerships up to ten in number are recognized. When such an association makes locations, each individual composing it being in possession of one or more "Miner's Rights," the combination claim allowable is determined in size by multiplying the length of the unit claim by the number of partners. Thus, for example, a three-man alluvial claim would be 225 feet long by 75 feet wide; and a seven-man lode or reef claim, for metals and minerals other than gold, silver, and platinum, would be 1050 feet long by 390 feet wide.

All claims must be laid off in rectangular shape, with their length along the line of the alluvial channel or pay streak, or along the outcrop of the lode or vein as the case may be, and the width at right angles thereto.

The class called "Extended Alluvials" may only be located on abandoned and previously worked ground, or very low grade gravels, or upon alluvial areas where, either by reason of excessive water, large boulders, or other objectionable conditions, the expenses of operating are greater than usual.

Mining properties of all kinds, whether single claims, partnership groups, company consolidations, or leased areas, are known legally as "mining tenements," a very convenient term for general use when properly understood.

The registration of alluvial claims is not required, it being assumed that the owner or owners practically live upon their ground and work it continuously until it is exhausted, and then abandon it. But registration is not forbidden, and may be effected by any claim holder who desires to do so. After the first three days of possession after staking, every alluvial tenement must have one shift of labor per claim, per day of 24 hours, put upon it, excepting for Sundays, public holidays, and the Saturday half holiday. The legal labor shift is of eight hours' length, and on Saturday four hours. Where a number of claims are blocked or consolidated, as in partnership or company operations, the work for all may be done at one place.

All other classes of mining tenements must be registered as soon after staking as possible, and do not become valid properties until they are. The law does not specify any stated time during which this act must be performed. The cost is five shillings per claim.

On "Reef" claims (which covers all kinds of metalliferous deposits in rock in place), the requirements to maintain title are one shift of labor, per two unit claims, per day of 24 hours, with exemptions as just mentioned. But this applies only during the period of exploration and development. As soon as production begins, and as long as it continues, the tenement must be worked as continuously as in the case of alluvial properties.

The district Warden has the power at any time to require that a mining tenement be surveyed, in which case the holder is compelled at once to deposit the cost of the same. The charges for this kind of work range from $10 for an area of one acre or less, to $250 for 5000 acres, and may be averaged at about $25 per diem for the Surveyor's time, he paying for his own assistants.

Reasonable and simple regulations are provided for the staking of dredging areas, and their registration. All applications for rights of this class, after being approved by the local District Warden, must be referred by him to the Minister of Mines, who may impose such working and other conditions as he sees fit,

excepting that a uniform rental of 2s. 6d. per acre per annum is charged, payable, as usual, in advance.

The registration of claims of all kinds is effected at the office of the district Warden.

It is the expectation of the law that as soon as a claim of any kind except alluvial is developed to the point where production of ore begins, the holder or holders thereof will call for a lease, and provision is made for the conversion of mining tenement into leases at any time. Previous to such conversion, except in the case of Alluvial and Alluvial Extended claims, production of and realization upon ore is not permitted.

The Governor only has the power to grant leases for mining purposes. The areas so obtainable for gold, silver, and platinum mining range in extent from 24 to 48 acres, with a maximum term of 21 years, renewable for a second term of the same length. The rental is five shillings per acre per annum for the first year, and 20 shillings per acre for each subsequent year, payable in advance.

For a lease covering metals other than gold, silver, and platinum, and for all minerals except coal, areas ranging in extent from 48 to 96 acres may be obtained, for the same term (with renewal right) as in the preceding paragraph. The rental is five shillings per acre per annum, in advance. For coal the maximum area is 300 acres, and no rental is charged. In lieu thereof a royalty of threepence per ton for the first ten years of the period is exacted, and sixpence per ton for its remaining years.

When leases are applied for to operate properties containing a metal or metals other than gold, silver, or platinum, or to mine for non-metallic substances, or combinations of any of them, the particular substance or substances which induced the applicant to apply for the lease, and which he expects to recover from his operations, must be specified in the application, and all leases of this kind must contain a reservation of the precious metals; that is to say, they do not convey the right to mine for gold, silver, or platinum.

When any one or more of these precious metals is found to exist

in ore produced from a mineral lease, the fact must be at once reported to the Minister of Mines. If, in the opinion of this official the value of the precious metal or metals recoverable is insufficient to make a payable property without the assistance of the value of the other metals or minerals that may at the same time be recoverable, he may impose upon the lessee a royalty of one shilling per ounce of gold recovered. But if he concludes that the property could be worked at a profit on the basis of the gold contents of the ore alone, he may demand the surrender of the mineral lease, and the substitution for it of a gold-mining lease. Or, the lessee has the option to agree to pay a royalty of ten shillings per ounce of gold recovered, and keep the mineral lease.

If, after taking a mineral lease, the holder thereof finds unexpected ore yielding substances other than the precious metals, and not specified in his lease, he must, under heavy penalty, and before producing or realizing upon any of the new material discovered, report to the Minister of Mines, who, at his discretion, may give him permission to operate for the new substance, in consideration of the payment of such an increased royalty as the Minister may decide upon.

Every application for a lease must be accompanied with the survey fee, and the first year's rental.

Leased premises may be used only for mining purposes, and such other activities as are naturally incidental thereto, and no sub-leases may be granted without the written consent of the Governor. A fee of 20 shillings is required when the papers for a lease of any kind are delivered.

After the registration of a mining claim, or the delivery of the papers of a lease, full conveyancing rights attach to the property, subject however to the consent of the Minister of Mines, the registration of the instrument of conveyance, and the payment of a transfer fee.

As a general proposition two or more leased areas may be consolidated under one ownership, so long as the total area in such consolidation does not exceed 96 acres. But, when it can be shown to the satisfaction of the Minister of Mines that a larger

area is necessary, in order to protect operations in the case of a vein or lode having a very flat dip, consolidations greater than 96 acres may be allowed, up to the extent of permitting operations to be carried on to a distance of 3000 feet from the surface, measured on the dip of the ore channel or lode.

Coal mining leases may be consolidated up to a total of 2500 acres, and, when the seam worked lies at a depth of over 1000 feet from the surface, to the extent of 5000 acres.

During three months after the expiration, forfeiture, or abandonment of a lease, the former owner may remove any machinery or other chattels that he may have placed upon it while it was in his possession.

All leases must be arranged for and registered at Perth, the capital of the State, where the office of the Minister of Mines is located.

RESULTS

In the British Australasian states gold production began in 1851, tin in 1872, copper in 1879, silver (other than that recovered from placer gold) in 1880, lead in 1885 and zinc in 1904. The value of the output of these metals in the sixty-six year term that has since elapsed up to the end of 1916, and the production of 1916, is shown in the following table.

Metal	Term	Totals	Average per year	1916
Gold.....	66 years	$3,214,597,945	$48,706,029	$40,392,700
Tin.....	45 years	144,419,540	3,209,323	4,793,700
Copper.....	38 years	287,457,073	7,564,659	20,827,800
Silver.....	37 years	286,408,141	7,740,761	8,500,000*
Lead.....	32 years	222,907,486	6,965,859	12,000,000*
Zinc.....	13 years	201,225,509	15,478,885	19,985,653
		$4,357,015,676	$89,665,516	$106,499,853

Taken altogether, the output of 1916 shows a gain of nearly 19% over the average of the term. In detail there were gains

* Estimated.

of 10% in silver, 175% in copper, 72% in lead, 29% in zinc and 49% in tin. Against these there was only a loss of 17% in gold.

But these conclusions, being based on values as measured in terms of gold, instead of on quantity in terms of any weight unit, are not truly representative of the condition of the industry, because of the abnormal prices which all the metals except gold have commanded during the last three years of the term, coupled with the very serious loss in the purchasing power of the yellow metal. To secure a better basis for a comparison of the Australasian results with those of the other principal mining regions of the world, the following table has been prepared, dating also from 1851 but terminating with 1913, and so avoiding the high figures of war times. This makes a more nearly correct exhibit both in general and in detail, though, as just stated, no figures based on values instead of quantities can be regarded as accurate, as will now be made clear.

The peak of gold production in this field was reached in 1903, when the output had a value of $87,462,252. Since then there has been a steady decline of more than 50%, which may be considered very serious in view of the loss of purchasing power of the metal during the last twenty years.

Tin production was at its best in 1906, when the product (mainly from Tasmania) sold for $5,781,944. This figure has not since been equalled, though the price of the metal has advanced from $600 per ton in that year to $880 in 1916.

In the item of copper the value of the product of 1916 exceeded that of the best previous year by only $2,353,872. But meantime the price of the metal had advanced from 20 cents per pound to 30 cents, corresponding to a decrease in the quantity at the last date as compared with the amount recovered during the best year.

In 1892 the silver product of Australasia had a value of $17,375,677, and the average price of the year was 80 cents per fine ounce. In 1906 the lead output sold for $11,629,135 on the basis of a price of $112, per short ton for the metal. The peak of zinc production was reached in 1909 when the output yielded

$30,367,038, the average price for the year having been $110 per short ton. These figures of output have not since been equalled, though meantime in each case except silver the market value of the metal had greatly increased, prices in 1916 having been 63 cents per ounce for silver, $136 per short ton for lead and $200 per short ton for zinc.

It is clear therefore that the mining industry in Australasia is not in as flourishing a condition as might be expected from the known mineral resources of that part of the world, and this unfortunate state of affairs may perhaps be fairly ascribed to the nature of the laws under which it is compelled to operate.

Australasia, 1851 to 1913 (inclusive): New South Wales, New Zealand, Queensland, South Australia, Tasmania, Victoria and West Australia

Metal	Term	Years in term	Total product of term	Average annual product during term	Product of 1913	Gain (+) or loss (−) in 1913 as compared with average
Gold.....	1851 to 1913	63	$3,076,222,339	$48,828,926	$52,781,525	+ 8%
Tin.....	1872 to 1913	42	136,820,740	3,257,636	4,749,759	+ 46%
Copper....	1879 to 1913	35	243,013,438	6,943,241	15,925,199	+129%
Silver.....	1880 to 1913	34	257,961,441	7,587,101	10,898,115	+ 44%
Lead.....	1885 to 1913	29	189,578,551	6,537,191	11,152,240	+ 70%
Zinc.....	1904 to 1913	10	151,854,020	15,185,402	23,559,424	+ 55%
			$4,055,450,529	$88,339,497	$119,066,262	+ 35%

CHAPTER IX

The Canadian System of Mining Law. Digest of the Mining Laws of British Columbia, Alberta, New Brunswick, Newfoundland, Nova Scotia, Northwest Territory, Manitoba, Ontario, Quebec, Saskatchewan and Yukon Territory. Results of the System. Statistics of Production from 1858 to 1916

THE CANADIAN SYSTEM

The mining laws of the various provinces of the Dominion of Canada, and of the Crown Colony of Newfoundland, are all constructed on the basis of what may be called the modern British theory of the business of mining; and while differing much in detail, have a strong family resemblance, and may properly be considered together. This underlying doctrine is to the effect that mining, being an occupation which, by its very nature, calls for the investment of more or less capital in development and equipment, the laws regulating it should be so drawn as to give capital all the opportunity it could fairly ask for. But while doing so the rights of the State as a whole must also be properly guarded, to prevent the development of conditions as to property of this kind which exist in the old country, and which in all parts of the Empire are regarded as unfortunate, and inimical to progress in the industry.

The provinces of British Columbia, Ontario, Quebec, New Brunswick and Nova Scotia, and the Crown colony of Newfoundland have each its own mining code, while what is known as the Dominion code governs operations in Manitoba, Saskatchewan, Alberta, the Northwest Territory, and the Yukon Territory.

In all of these the paramount ownership of the state in metalliferous minerals existing on the public domain, and also on privately owned land except where the mineral rights have expressly passed in the deed of grant, and except on tracts alienated prior to certain dates, is definitely asserted. In British Columbia, Ontario, Quebec, and Newfoundland patents (called Crown Grants) may be secured, but in Quebec the right is retained by the government to insist upon annual labor on all such grants, and in Ontario the ownership of the timber is reserved. Elsewhere, only leaseholds are obtainable, so that it is hoped and believed that the rise and growth of large landed estates containing undiscovered mineral resources will be prevented throughout British America, except in British Columbia and Newfoundland.

Presumably, with the intent to encourage discovery, all the codes except that of the Dominion provide regulations for that line of activity called prospecting, while in the case of the Dominion the same end has been sought by relieving the prospector from most of the obligations that are imposed upon him in the other provinces. But when some of these laws are critically examined it becomes clear that the framers of them have assumed, in accordance with the British doctrine, that prospecting was a business which, like mining, required the backing of capital, and accordingly the occupation is governed—excepting in the Dominion code—by rules and regulations which practically bar the prospector (as the character is known in America) from the field. Thus, in Newfoundland, one may freely search and dig, but may not locate a claim, or take away and sell anything found, until a prospecting license has been purchased; while in Nova Scotia, a claim may be located without a license, but digging or the removal of anything found is strictly prohibited until one is secured. In Ontario, Quebec, and British Columbia licenses are required before either digging or claim-staking can be done, and heavy penalties are provided for violating this rule. As licenses in these provinces cost all the way from $5.00 to $10, are good for one year only, and permit of the location of

but one claim in Newfoundland, Nova Scotia, and New Brunswick, three in Ontario and five in Quebec, it is evident that the belief was held by most of the lawmakers that prospectors are people of some means, or else are in the habit of securing the backing of capital before engaging in exploration. In fact it is impossible to study the provisions of these laws (except in the case of the Dominion) without reaching the conclusion that they have been drawn and enacted with only a partial knowledge of the exigencies of that most important part of the mining industry which has to do with the discovery of new ore deposits. Perhaps the best example of this misconception is to be found in those sections of the Nova Scotia code which are supposed to provide for the rights and necessities of the individual who is moved to go out into the hills and search for gold in the beds of streams or in the bars along their courses. It will be unnecessary and even dangerous for such a party to carry with him any tools, for while he may freely look over the country, even where the surface rights have been alienated, he dares not dig until he has taken out a prospecting license, and he cannot take out this until he is prepared to describe with accuracy—as to metes and bounds—the area upon which he wishes to dig, for the license calls for full details on this point, is good for three months only, and costs $4.00. Consequently no time must be lost or mistakes made. But if under these rather discouraging conditions he does decide upon staking out a piece of ground that appears to contain pay gravel within its limits, and has taken, we will suppose, the minimum sized claim of 40 acres, it is interesting to note the responsibilities he has assumed. Before sticking a pick into the ground he must pay for the license at the rate of 10 cents per acre for the 90-days' privilege. Having done this he may go to work, and at the end of the term, if he has found enough encouragement to incline him to continue, he must first pay the royalty of 2% on the gross value of all gold so far recovered, and then $250 in cash, whereupon he will be granted a document called a "prospecting license" which gives him the right to operate his claim for the succeeding 12

months, in consideration of a further cash payment of $160, being 50 cents per unit area of one-eighth of an acre on his 40-acre tract.

In New Brunswick the provisions of the law seem equally severe. There, however, the prospector is allowed to stake off his claim before applying for a license, but prohibited from doing any digging upon it until the license is issued. But at this point he must be very careful, for there are two varieties of this document. One is entitled a "License to Prospect" but is good only for gold and silver. The other is called a "License to Search" and covers all the other metals. Not having been allowed so far to do any digging, and so not knowing just what he will find when he does get to work, he probably must take out both, to cover all contingencies. But neither of these gives him the right to remove and sell anything of value that might be found in case he takes the desperate chances and begins digging. For this privilege he must apply for still another document, called a "License to Work." If the prospector has located the maximum sized claim of 12½ acres, his license to prospect will have cost him $27.50 and is good for 12 months. The license to search costs $20, is good for 18 months and enlarges his area of activity to a tract five miles square, but gives him no exclusive rights therein, and must be surveyed at his expense before any exploring work is done. The license to work costs $50, is good for two years and carries the right of one year's extension at a further fee of $25. It covers any area desired up to 640 acres, to be selected out of the five mile tract, with preference rights in making the selection.

Under the law in Quebec, where the prospecting license costs $10 and is good for 12 months only, if any ore is found no right is conferred to remove and realize upon it, and a penalty of $200 follows a violation of this rule. Thus the prospector is wholly prevented from making his work pay even in part as it goes along. However, by taking out a second permit called a "Mining License," at a cost of $10, and paying down in cash, in advance, the rental of 50 cents per acre on his claim, he can sell or treat his ore.

As the minimum size of claim in this province is forty acres, the right to realize, after making a discovery, costs $30.

These examples illustrate—perhaps in an extreme way—a conception of the nature of the business of prospecting which it will be hard for the American miner to comprehend, until he grasps the idea that the Canadian prospector is assumed to be an individual in the employ of a corporation. For such the laws are excellent. The prospecting areas to be had are abundantly large, the times allowed for exploration are ample, and the fees and charges very moderate, in fact almost negligible from their point of view.

In the matter of the steps that must be taken in the acts of location and recording, and the requirements to maintain title during the period usually devoted by a discoverer of a new ore deposit to making such explorations as are necessary to enable him to decide whether or not his find is going to be worth keeping, the provisions of the Canadian laws are liberal, but very expensive from the point of view of the wandering prospector, and indicate again that they were prepared mainly for the use of the class who have money to invest, instead of for those who can put only their time and labor into the business. Extralateral rights are now nowhere allowed, although they were in British Columbia, under its first law—now repealed—and so this means of conferring more or less of a selling value upon an undeveloped discovery or prospect does not exist. There is therefore little incentive to individual prospecting through out the whole of British North America, and new discoveries during the last 20 years have been almost entirely the result of accident, as in the case of the nickel-copper deposits of Sudbury, the silver lodes of Cobalt, and the gold veins of Porcupine.

The mining industry in Canada is nevertheless already of great importance. The vast area of primitive rock that encircles Hudson Bay and extends northwest to the Arctic presents a wonderful field for exploration, and contains undoubtedly a great number and variety of metalliferous deposits awaiting discovery and development. The severe climate will not pre-

vent this if the mining laws are of such a nature as to attract the individual pioneer prospector. The experiences of British Columbia and the Klondyke indicate what may be expected in the future under like conditions; and the experiences there since the laws were changed, and in the other provinces where the incentive to prospecting has never existed, indicate what may be expected in the future. Outside of British Columbia the history of discovery in Canada has been spasmodic rather than steady.

The Dominion code, covering as it does such a very large area of totally unexplored country, and allowing free prospecting, would attract the individual explorer strongly if he could secure a fee simple title as in British Columbia, Ontario, Quebec, and Newfoundland, and still more powerfully if extralateral rights were accorded to lode claims. Without these, the development promises to be much slower than that of Alaska, where the climatic conditions are more severe, the topography more rugged, and the available area of primitive rocks very much less.

The Ontario code fails to attract prospectors because of the expensive license coupled with its limited location privileges, in spite of the great lure of a fee simple title.

In British Columbia the attempt has been made to balance the abolition of the extralateral right, as an incentive to discovery, by the enlargement of the lode claim area to a square of 1500 feet, but the initial cost of the license, even when labeled a "Free Miner's Certificate," has barred out the cashless pioneer. The other provisions of the law are excellent.

In the rest of the political units of British America the laws put such heavy burdens on pioneer mineral explorers that the regions have been practically abandoned by them, and what remains of the public domain is rapidly passing under private ownership for agriculture, grazing, forestry, coal and iron mining and other purposes, as have the lands of Europe, where vast mineral wealth yet remains undiscovered because of the unattractive features inevitably connected with prospecting over land already individually owned.

BRITISH COLUMBIA

(Law of 1897, with amendments to January 1st, 1917)

This Province of the Dominion of Canada holds, for the benefit of its citizens as a political entity, and offers for disposal, under the terms of its mining law, any and all mineral deposits of all kind except coal, that can be found on, in, or under its remaining public domain; also any (except coal) that may be found under the surface of such formerly owned parcels of the same where the mineral rights have been reserved when surface rights were granted. For all these, under proper procedure, it will issue Crown Grant (fee simple title) if desired.

Any individual over 18 years of age, who desires to prospect for mineral deposits, surface or underground, must first take out a document called a "Free Miner's Certificate," also any company organized and incorporated for mining purposes. The cost of this certificate for an individual is $5, for a company with a capital not in excess of $100,000, $50; for a company with a capital in excess of $100,000, $100. It is obtainable from any Gold Commissioner or Mining Recorder. It is good for 12 months, and is renewable annually at the same cost. The possession of it gives the right to prospect, locate claims, and carry on mining operations. Any number of claims may be acquired by those who hold one, except that only one may be located on the same vein, or in the same valley in the case of an alluvial location.

When an alluvial claim is located no under surface or rock mining rights are created, and if the location is on a vein or ore deposit, no placering rights go with it. Finally, the certificate includes an individual game license.

For alluvial or placer mining the claim, when laid out in the bed of a creek is 1000 ft. wide and 250 ft. long, in the direction of the creek. If on a bar or bench, it is 250 ft. square. But the first discoverer of a new placer creek is allowed to take up an additional claim along the creek which can be 600 ft. long by 1000 ft. wide. For underground operations, or what is known

generally as a quartz claim, the dimensions are 1500 ft. by 1500 ft. No extralateral rights go with any of these claims.

The location acts required are simple, inexpensive, and effective. Discovery of metal or mineral is a necessary preliminary to a valid location of any kind, and all locations must be laid out as nearly rectangular as possible.

Recording is required within 15 days of date placed on discovery stake, if location is within 15 miles of the Recorder's office. An extra day is allowed for each additional 10 miles of distance, or fraction thereof. The recording acts are simple, but require the personal presence of the claimant at the Recorder's office. The fee is $2.50. After record is made, conveyancings acts of all kinds are absolute.

Maintenance requirements. In the case of placer claims the "Free Miner's Certificate" must be renewed annually, but the cost of doing so is reduced to $2.50. Also, at the same time the claim must be again recorded. During the working season the claimant must prosecute continuous work, or put a man in his place. A total of 72 hours of cessation is allowed, or nine days of eight hours each. The beginning and end of the working season are determined and publicly announced by the Gold Commissioner of the district. For quartz claims the "certificate" must be renewed annually at a cost of $5, and during the year labor to the value of $100 must be performed and affidavit of same made and recorded. The recording fee is $2.50. Or, in lieu of labor, $100 in cash may be paid in to the Recorder. Also, during the first year of possession, the claim must be surveyed by the provincial surveyor, at claimant's cost. But this expense, up to the value of $100, is allowed on annual labor account.

No royalties of any kind are required.

Crown Grants. These documents, which are the equivalent of a U. S. Patent, and convey a fee simple title, are not given on placer claims, but a Lease for any period up to 20 years may be obtained for the latter by arrangement with the district Gold

Commissioner, on terms approved by the Lieutenant Governor in Council; also for water rights.

For quartz claims, after holding the same for five years, and completing five annual labor requirements (or making five cash payments), together with affidavits and records of the same, the claimant is entitled to apply for a "Certificate of Improvement," which, if granted, relieves him of all further annual labor requirements, and places him in a position where he can make application for Crown Grant. During this five year period the title to a quartz claim is regarded as an annual lease, renewable indefinitely, upon compliance with requirements as stated. There is no obligation to apply for Crown Grant.

The procedures for securing Crown Grant are simple and inexpensive. The fee upon issuance of same is $25 for underground rights and $10 for surface rights, making a total of $35 for a tract 1500 ft. square, containing, roughly, 50 acres.

DOMINION OF CANADA

(Law of 1913, with amendments to January 1st, 1917)

The provisions of the Dominion Mining Law cover only the Provinces of Manitoba, Saskatchewan, Alberta, the Northwest Territory and the Yukon Territory. Within these limits the Government asserts its paramount ownership of all mineral deposits of all kinds on the public domain, otherwise known as Crown Land; and will not sell the same. Instead, it grants annual leases for specified areas. These are of two kinds, namely, for quartz or underground mining, and for surface or placer mining.

Prospecting is free to all individuals over 18 years of age, subjects or aliens, male or female. No license is required. Discovery of metal or mineral is necessary before planting stakes. Location acts are simple, inexpensive, and effective. An unlimited number of claims may be located, but only one on a stream, or on the same vein. But the discoverer of a new placer creek is entitled to three extra claims.

Recording must be effected within 10 days of date of planting discovery stake in the case of placer claims, and within 15 days in the case of quartz claims, provided, in each case, the claim is within 10 miles of the Recorder's office. An extra day is allowed for each additional 10 miles of distance, or fraction thereof. Recording fee is $5, on payment of which a certificate is issued good for 12 months, conveying exclusive mining rights and privileges, conditioned upon the performance during the year of $100 worth of labor on the claim, and the recording of an affidavit evidencing the same. This certificate is renewable from year to year indefinitely, on the same terms.

For underground operations, the claim area is 1500 feet square; for surface operations, 500 feet in the valley or alongside of a stream, and 1000 feet wide. All claims must be laid out as nearly rectangular as possible, and orientated. There are no extralateral rights, and no royalties of any kind.

Conveyancing rights are complete after recording.

NEW BRUNSWICK

(Law of 1903, with amendments to January 1st, 1917)

Metals and minerals of all kinds, on both public and private lands, are the property of the State, and are obtainable for mining purposes by individuals or corporations only under leasehold title. When they are discovered or suspected on areas the surface rights of which have been alienated, the miner or prospector who desires to explore and excavate must not only apply to the Government for such rights, but must come to an understanding with the surface owner. If the latter is unreasonable in his demands, the law provides a procedure by which, at some little expense, he may be compelled to grant fair terms.

Prospecting, if by that is meant merely looking over apparently unoccupied or unused areas of the country for outcrops or promising indications of the presence of valuable minerals, either alluvial or underground, is free. But no excavating work of any kind is permitted without first taking out a license. However, the

law specifically provides that if the prospector finds "indications" on what seems to be unoccupied land, he may stake off a tract of a certain size, and in a certain way hereinafter described. Then, within a week, plus 24 hours additional for each 15 miles of distance between the tract and the office of the Surveyor General at Fredericton, the capital of the Province, he must appear before that official, and apply for a "License to Prospect," which document, when obtained, gives him the right to dig and explore. There are, however, several kinds of licenses. The one just mentioned gives him the right for gold and silver only. Another, called a "License to Search," covers all other metals and minerals. Neither permits him to remove and sell anything found. For that it is necessary to obtain another kind, called a "License to Work."

The unit area for mining property of all kinds is a tract of land rectangular in shape, magnetically orientated, and measuring 150 feet on an east and west line, and 250 feet on a north and south line. Any number of these between 10 and 100, assembled in a compact block, whose length does not exceed twice its breadth, may be applied for as a prospecting tract, and, if not lying within the limits of an already proclaimed mining field, will probably be allowed.

The "License to Prospect" is good for any period up to 12 months, at the discretion of the Surveyor General. It costs, for the first 10 units of its area, 50 cents per unit; for any further number up to 100, 25 cents per unit. Thus a tract containing 24 units, which would correspond closely to the American mining claim of approximately 20 acres, would cost $8.50. Any desired number of such areas may be applied for under one license, and the prospector's title to the same holds good during the life of his license, which latter may be renewed once, for not over 12 months at a cost half of that paid for the first term.

The "License to Search" is good for 18 months. It covers all metals and minerals except gold and silver when occurring by themselves, but includes them when they are associated with other metals. The maximum area allowed under this form of

permit is five square miles, which must be laid out in a correctly orientated rectangular block, not over 2½ miles in length. The cost, on application, is $20. It must be surveyed at the expense of the applicant, and full reports from time to time made to the Surveyor General, giving details of progress of exploratory work. This permit, however, does not convey an exclusive right to the area so laid out. Other similar licenses may be granted for the same ground. But the first licensee has priority of right in making final selection from the tract. The selection may be made at any time during the term of the permit, and may consist of any part of the tract not to exceed one square mile in area. But it must be of rectangular shape, orientated magnetically, and not over 2½ miles in length. At the time of selection the applicant must apply for a "License to Work," accompanying the application with a survey of the selected tract, and a fee of $50.

The "License to Work" is good for two years, with privilege of one year's extension at half the cost of the first term. Within this three years genuine mining must begin, and must be continuously prosecuted thereafter. A "License to Work" may be applied for without previously taking out a "License to Search." Any holder of a "License to Work," is entitled, at any time during its period, to call for a Lease.

In licenses of all three kinds, if any part of the selected areas is on privately owned land, the applicant must make arrangements with owner of same for surface rights, must give bond to indemnify him for possible damages, and to the government that the required reports will be made, and the royalties paid when due.

Leaseholds. Any number of contiguous unit areas that make up a rectangular block with sides magnetically orientated, may be applied for as a leasehold for mining purposes. The application must be accompanied by a deposit of $2.00 per unit area, which is credited as the rental for the first year. Thereafter the lease is renewable from year to year at a cost of 50 cents per unit area, payable in advance.

All leases are made out for a term of 20 years, but may be

surrendered at any time. They also may be declared forfeited at any time in the event of default in payment of rental or royalty, or of the fulfillment of the annual labor requirement.

The number of days of labor required, per annum, to maintain the validity of the lease, is determined in each case by the Lieutenant Governor in Council, and is wholly a matter of his discretion.

Leases may be renewed at the option of the Government at the end of the 20-year term, for a second period of equal length. Also for a third and fourth period, but for no longer, under any circumstances.

On all leases quarterly reports are required, giving the number of days of labor employed during that term, the tons of ore raised, the party or parties to whom the same were sold, with details of each parcel, the tons of ore milled and yield of same in metal, and the total value of the products of all kinds.

Royalties.

On gold and silver, 2½% of the gross value recovered.

On copper, 4 cents per unit (1%) per ton of 2352 lbs.

On lead, 2 cents per unit, per ton of 2240 lbs.

On tin and gemstones, 5% of the gross selling value.

On other metals and minerals, as may be determined by the Surveyor General and the Lieutenant Governor-in-Council.

NEWFOUNDLAND

(Law of 1903, with amendments to January 1st, 1917)

Mineral deposits of all kinds, whether occurring in public or private lands, are the property of the State.

Prospecting is free, without preliminary license. The prospector may make any diggings or excavations necessary to find or expose mineral (except on land already covered by buildings or growing crops), but may take away samples for assay only.

Such operations do not confer any exclusive right to prospect over any defined area, or lay the foundation of any right. But as soon as a discovery stake is erected, upon which the name of

the discoverer and the date of discovery is inscribed, the prospector acquires the preferential right to apply to the Minister of Mines for a license to locate a claim.

This application must be made within two months of the date inscribed on the discovery stake; otherwise the right lapses, and the ground may be applied for by another.

The fee, with application, is $10.00.

This license permits the holder to locate one claim, and to enjoy the exclusive right to explore underground, within its boundary lines, for 12 months. The maximum size of the claim is 2640 ft. by 5280 ft., equal to 320 acres. Its shape must be that of a parallelogram. Its possession conveys no surface rights whatever, no extralateral underground rights, and no rights to remove and realize upon ore found.

At any time within this 12 months the holder can call for a 99-year lease, at a rental of $20 for the first year, $30 each for the next five years, $50 each for the next five years, and $100 each for the remaining years of the term. At any time during the period of the lease it is forfeited automatically by failure to pay the rental when due. Also, at any rental-payment date the Government will accept in full satisfaction for unmatured rental a sum equivalent to its value at the time, on the basis of 3% interest per annum. The lease conveys mining rights to all minerals found vertically under the surface within boundary lines.

To obtain necessary surface rights for mining purposes, the claimholder may select a tract of any shape, and of any size up to 50 acres, within the lines of his claim, provided the same is not already in use; and upon marking its boundaries, and delivering diagram of same to the Minister of Mines, he acquires the use of the area for mining purposes, during the life of his lease.

Annual rental on leasehold premises is payable in advance.

Fee simple title is granted to any lessee, on a location not exceeding 320 acres, who shows that during the first five years of his occupancy he has expended not less than $6000 for surface or subterranean (or both) bona fide mining work, by which not less than 10,000 cubic yards of rock have been excavated.

All mining property remains in perpetuity open at all reasonable hours and times to duly authorized government officials, or their representatives, and all mine operators must keep books of account, which also must be held open for official inspection.

No royalties of any kind are required.

NOVA SCOTIA

(Law of 1911, with amendments to January 1st, 1917)

Prospecting, when confined simply to looking around, is free on all public and private lands not already occupied or in use, so long as no digging is attempted. During such preliminary inspections, if any promising indications are found, a claim may be staked and a discovery post erected, upon which the name of the discoverer and the date of the discovery should be inscribed. If within 15 miles of the office of the nearest Mining Commissioner, application for digging license must be made within seven days. An additional day of 24 hours is allowed for each additional 15 miles of distance or fraction thereof.

Digging Licenses are of three kinds, viz., "Alluvial License," covering only surface gravel deposits, such as are commonly known as placers; "Prospecting License," covering only veins or deposits of gold or silver—or both—in rock in place; and "License to Search," covering all other metals or minerals in rock, except coal. Applications for any one of these must be made in person and in writing on a specified blank, and must describe the area desired and the metal or metals or minerals expected to be found. If a license is granted, a survey at the cost of the applicant may be required. If the area is on alienated land a suitable bond must be given to reimburse the owner for possible damages. All licensees must keep books of account, and may be called upon at any time to exhibit them. All licenses in good order may be transformed at any time into leases, at the option of the licensee, upon compliance with the requirements or may at will be abandoned.

The unit area is a rectangle measuring 250 ft. and 150 ft.

on its sides, and containing therefore about eight-tenths of an acre. All areas for prospecting or mining purposes must be multiples of this unit, compacted into one block.

The Alluvial License is good for three months, and can be obtained only between March 31st and December 1st. With it a claim containing up to 500 unit areas may be filed. The filing fee is 10 cents per unit area, and to maintain possession the claimant must perform 40 cents' worth of labor per unit during the three months' term. At its end, if the licensee reports correctly all metal or ore recovered, and pays the proper royalty, then, in consideration of a fee of $250, a license good for an additional term of 12 months will be granted.

The "Prospecting License" is good for 12 months and must cover not less than six units of area, nor more than 100 of them. Its cost is 50 cents per unit per annum.

The "License to Search" is good for 18 months, and with it an area up to five square miles may be located. Its cost, payable on application, is $30.

All these preliminary licensed areas may be converted at the option of the claimant at any time into leaseholds. Until that is done (except in the case of alluvial claims) no ore selling rights exist. Leasehold areas are of two kinds, as follows:

For gold and silver quartz mining. The size is unlimited, but must not be for less than six unit areas adjoining. The application fee is $2 per unit. The maximum term allowable is 40 years. The rental is 50 cents per unit area per year payable in advance. The labor requirements are as follows: if the area contains less than 10 units, 40 shifts of work per unit per annum; if it contains from 10 to 19 units, 30 shifts per unit per annum; if it contains 20 to 29 units, 20 shifts per unit per annum; and if it contains 30 units or more, then 10 shifts per unit per annum. A royalty of 2% of the gross value of the gold and silver recovered is also exacted. This form of leasehold is assignable only with the consent of the Governor in Council.

For all other metals or minerals. The maximum area allowable for copper or lead mining is 320 acres; for all other metals

160 acres. The fee on application is $50. The maximum term is 20 years, but this is renewable three times at the option and on the terms of the Governor in Council, making possible a total term of 80 years. The annual rental is $30, after the first year, payable in advance. Royalties are as follows: on copper, four cents per unit (1%) per ton of ore at mine weights; on lead, two cents per unit; on tin, 5% of the gross value in the ore. This lease, like the other, is assignable only with the consent of the Governor in Council. The Lessee is required to monument all his corners within six months of date of lease, under a penalty of $100 per monument in default, and maintain the same in good order during term of lease.

ONTARIO

(Law of 1908, with amendments to April 27th, 1917)

The Government offers the fee simple title for mining purposes, of the surface and underground on all public lands, and on all private land alienated since May 6th, 1913, except certain reserved tracts mentioned in Secs. 34–43 of the Mining Law, and also certain forest areas referred to in Secs. 44–47 of the same. On the last mentioned, leases may be obtained.

For exploration, and development purposes it issues licenses. No person is allowed to prospect or mine on lands subject to the provisions of the mining law, unless 18 years or over in age, and in possession of one of these documents.

A mining license is obtainable from the Bureau of Mines in Toronto, or from any mining recorder. It costs $5, and is valid up to March 31st after its issuance date. May be renewed annually at the same cost. Gives the right to locate up to three full claims per annum, in any one or more of the mining districts or Divisions of the Province.

The mining claim may be of any size desired up to 40 acres. If on surveyed land it must conform to the legal subdivisions. If not, it must be as nearly square, and its boundary lines orientated as correctly as possible under the circumstances.

In certain special districts no claim exceeding 20 acres is allowed. No extralateral rights exist. Discovery of mineral before staking is required. Location acts are simple and effective. Survey may be required.

Record must be made within 15 days of the date on the discovery stake, if not over 10 miles from Recorder's office. An extra day is allowed for each additional 10 miles of distance. The record must be endorsed on the mining license. The fee is $10.

During the 60 days following record the claimant remains simply a "licensee of the Crown." But if, by the end of that term his claim, on due examination by the district Inspector, has been approved as "in order," and no adverse claim has been filed, he may demand a "Certificate of Record," and should do so, or the title remains questionable. This document costs $1.00.

During the three months succeeding the issuance of the Certificate of Record, 30 shifts of labor, of eight hours each, are required; during each of the first and second 12 months following the end of this three-months' period, 60 shifts of eight hours each; during the third 12 months, 90 shifts of eight hours each.

Affidavit of same must be filed for record in each case, within 10 days of the completion of the work. If the claimant has adjoining claims, this work may all be performed on any one of them.

On completion of these labor requirements, if after due examination they are approved by the district inspector, a document called a "Certificate of Performance" will be granted, upon payment of $1.00.

Transfers of title of unpatented claims are allowed at any stage of the process of making title, provided the same are recorded.

If the claim is on alienated land, the claimant must arrange with the owner for such surface rights as he may need. If the demands of the owner are considered excessive, he can be compelled, at some cost, to agree to reasonable terms.

After completing the three years and three months of labor as above specified, and within the nine months immediately

following, application for patient must begin. If not, a fourth year of labor—on the terms of the third—must be performed before application can be made. The proceedings consist of a tender of the price of the land, which is $3 per acre if within surveyed territory, or $2.50 per acre if not; if on land whose surface rights have been alienated, or if for a placer claim, the price is half of these figures; if on unsurveyed land, the claim must be surveyed by a Government surveyor, at the cost of the claimant. The patent conveys all Crown title in fee simple, except the right to cut and use the pine timber within its boundary lines. But it involves the obligation on the part of the claimant to make annual reports on output (in weights and values), and to furnish employment statistics; and such reports may be called for monthly, by the Bureau of Mines, at its option.

Placer claims are acquired, maintained, and patented under identical conditions, and are of the same size.

Prospecting Areas. If for any reason a holder of a mining license desires to prospect an area thoroughly before setting discovery stakes, he can secure the exclusive right to do so for a strip of ground 50 feet wide and 150 feet long, by erecting two stakes called prospecting "pickets" at the center of the extremities of said strip, and by conforming to several other simple requirements. Thereafter, "so long as he is diligently and continuously prospecting" on the said strip, he is entitled to "the exclusive right to prospect, and to make a discovery thereon."

QUEBEC

(Law of 1913, with amendments to date of January 1st, 1917)

The Quebec mining law is based on the doctrine that mining rights "constitute a property under the soil, separate and distinct from that of the soil that is above it." It announces that the government, for the benefit of the Province as a political entity, retains the title to all such rights in the case of gold and silver, even on privately owned land, and in the case of all other metals and minerals, except on tracts alienated prior to July 24th, 1880, and excepting in the case of mining grants already

made. It therefore offers to sell or lease mining rights to first bona fide applicants, to be used, however, solely for mining purposes and operations legitimately connected therewith, and under the provisions of the law. To such purchasers or lessees full conveyancing rights pass.

A prospecting license is required. The cost is $10. It is good until the 1st of January following date of issuance, and is renewable annually indefinitely, at the same price. Under it five claims per year may be located. Discovery and corner stakes are required, and blazed lines from discovery to corner 1 and thence around the claim. The nearest office of the Department of Mines must be notified of the location "without delay," so that details of the same may be registered there and endorsed on the license. Within six months from discovery date the claimant must perform 25 days (of eight hours each) of labor on the claim, and apply for a mining license, or the claim is considered forfeited. Until the mining license is obtained no metal or mineral may be taken from the claim except in the way of assay samples, under a penalty of $200 and costs.

The unit claim is a rectangle, containing anywhere from 40 to 200 acres, at the option of the locator.

The mining license costs $10 per year, plus 50 cents per acre per year, and is payable in advance. During this period the claimant must perform 25 days (of eight hours each) of labor per 40 acres or fraction thereof, must have the claim surveyed if on unsurveyed public land or on private land, and in the latter case consent of the surface owner must be obtained before explorations begin. If this is refused, or hard terms are demanded, ample means are provided in the law to compel him to be reasonable, although they may involve considerable expense. Operating under a mining license is equivalent to a leasehold. The $10 fee and 50-cent acreage tax must be renewed annually, and full reports of all operations made to the Inspector of each district on dates of renewal, for the year just ended.

Royalty may be charged, at the option of the Governor in Council, but cannot exceed 3% on the net value of the output.

Fee simple title, covering both surface and sub-soil mining rights—except in the case of claims located on private land, when surface rights must be obtained from soil owner—can be secured from the Government on the following terms:

1. In the case of claims producing gold or silver either alone or in connection with other metals, on payment of $20 per acre if within 20 miles (by nearest practicable road) of a railroad, or $10 per acre if over 20 miles.

2. In the case of claims producing neither gold nor silver, but yielding any other metal or minerals, $4 per acre if within 20 miles of a railroad, or $2 per acre if over 20 miles.

Even after passing title, annual labor on the claim is required by the government, to the extent of $500 per 100 acres or fraction thereof in the case of claims producing gold or silver, and to the extent of $200 per 100 acres or fraction thereof on other claims. Finally, all mining claims to which leasehold or freehold title has been granted are subject to an annual tax of 10 cents per acre.

RESULTS

The production of metals began in Canada with the discovery of gold in British Columbia in 1858. Copper mining began in Newfoundland in 1872 but did not become important until 1879. Silver production—other than that recovered from placer gold—dates from 1880 so far as reliable statistics indicate. Nickel became a factor of the output in 1889, lead in 1890 and zinc in 1906. From the first date up to and including 1916 the statistics are as follows.

Metal	Term	Totals	Annual average	1916
Gold	59 years	$385,736,840	$6,504,014	$22,800,000
Copper	38 years	201,197,812	5,294,679	31,930,515
Silver	37 years	190,504,015	5,148,757	16,854,635
Nickel	28 years	161,903,419	5,782,265	29,035,497
Lead	27 years	38,627,570	1,430,651	3,850,829
Zinc	11 years	10,122,784	920,253	6,532,768
		$988,092,440	$25,080,619	$111,004,244

Hence the gain in value at the end of the period in the case of each metal, over the average production of the term, has been, for gold 250%, for copper 503%, for silver 227%, for nickel 402%, for lead 169% and for zinc 609%. These are apparently very remarkable results. But being based wholly on values instead of on quantities they are misleading, and particularly so in view of the fact that during the last three years of the term abnormally high prices have prevailed for all metals except gold, while at the same time the latter has lost greatly in purchasing power, probably to the extent of 50%.

To present the results in a more normal way, and for comparison with similarly worked out figures for the other great mining fields of the world, the following table has been prepared, which terminates with the statistics of 1913, thus eliminating the effect of the high prices that have prevailed in the metal market since the opening of the European war. This still makes an excellent showing for the Canadian field, excepting in the case of zinc, which is produced only in British Columbia.

Canada, 1858 to 1913 (inclusive): Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland, Northwest Terr., Nova Scotia, Ontario, Quebec, Saskatchewan and Yukon Terr.

Metal	Term	Years in term	Total product of term	Average annual product during term	Product of 1913	Gain (+) or loss (−) in 1913 as compared with average
Gold.....	1858 to 1913	56	$328,074,825	$5,858,479	$16,598,923	+183%
Copper....	1879 to 1913	35	140,801,097	4,022,888	12,676,135	+215%
Silver.....	1880 to 1913	34	144,463,714	4,248,932	19,040,924	+348%
Nickel.....	1889 to 1913	25	115,326,547	4,613,062	7,076,945	+ 53%
Lead.....	1890 to 1913	24	31,439,727	1,309,989	1,642,680	+ 25%
Zinc.....	1906 to 1913	8	1,800,360	225,045	159,488	− 29%
			$761,906,270	$20,278,395	$57,195,095	+182%

Considering the field as a whole, and disregarding all statistics later than those of 1913, the status for each metal may be briefly summarized as follows: The peak of gold production occurred in 1889 with an output of $27,957,776, which corresponded with the best year at the Klondyke. Copper production steadily grew in value up to 1912 when the output was worth $13,519,251. This was also the best year for silver in the Dominion, when the product sold for $19,425,656. The record year for nickel was 1910, with a crop valued at $11,181,310. The lead maximum was in 1906 when the output had a value of $3,054,065; and for zinc the date was 1912 when the metal recovered sold for $679,462. None of these maxima were equalled up to the close of 1913.

CHAPTER X

The South African System of Mining Law. Digest of the Mining Laws of the Cape Province, Natal, Orangia, Rhodesia, and the Transvaal. Results of the System. Statistics of Production from 1879 to 1916

THE SOUTH AFRICAN SYSTEM

These laws, embracing the codes of Rhodesia, the Transvaal, Orangia, Natal, and the Cape Province, present very strong family resemblances, and are markedly different from those of any other mining region. This had resulted first from the sociological conditions that have existed during the settlement of the country, second because of the unusual forms in which its mineral wealth came under the notice of the white man, and third, from the rapidity with which, in the last forty years, the culture of its inhabitants has changed from semi-civilization—and even barbarism—to modernity. It will be interesting as well as helpful to an understanding of the peculiarities of its mineral laws to give certain details of the land and its inhabitants.

About 92% of its population (which in 1910 was estimated at 8,400,000) are native blacks or colored people, including a small number of Asiatics, mainly Hindus. The former are the laborers. It is against the law to train them to perform any kind of work requiring discretion or initiative, although in the older parts of Natal and the Cape Province the infraction of this regulation is winked at by the authorities, and a very considerable number of the pure natives have, by ability and faithfulness, won the confidence of employers and occupy positions of trust requiring knowledge and education. But they have no standing

as citizens. They are allowed to do any work requiring physical strength or manual dexterity but debarred from all other lines of activity. In the mining industry, for instance, they may learn to use the hammer and drill, and become very expert at the work, but may not point, load or fire holes or operate a machine drill; they may fire the boilers of a power plant but may not handle the engine. Throughout the whole sub-continent the white man directs, supervises and operates machinery, and is absolutely debarred from common labor. If he trespasses this unwritten law he loses caste at once. This absolute color line has had its natural effect upon the mining industry, for it has made the business of prospecting impossible. There is not one of these pioneer mineral explorers in the countries under consideration. Consequently the discovery of new mines is a rare incident, and always purely a matter of accident.

In its upland and mountainous parts where the mines are to be found, it is a semi-arid and—during the rainy season—an unhealthy land, afflicted with malaria in the valleys, sparsely timbered, provided with no navigable rivers, but crossed with innumerable water courses which are raging floods during a part of the year, and often little more than series of stagnant pools during the remainder. Such a country affords meagre camping facilities and does not invite the wandering explorer. But during the four or five months of the winter few regions possess a climate more attractive. There is a monotony in the scenery which at first is depressing but later becomes restful and conducive to moderation in activity. It is an ancient land, which has been inhabited for many centuries by uncivilized native races who have left behind them traces of the rude stage of culture to which they attained in the way of crude rock paintings, roughly built stone structures, and, in certain parts, a vast number of shallow excavations along the lines of outcrop of gold bearing veins. The date of these prehistoric labors has not been satisfactorily determined and perhaps never may be as there is a total absence of all inscriptions upon even the most pretentious of the ruins. But it is fairly well agreed among archæologists that at some period

of the past there was considerable commerce with Arabia and Egypt, and possibly with India, and much mingling of the natives with these foreigners. Certain parts of the interior uplands were certainly through many centuries the site of an extensive gold mining industry, the metal having been recovered from the outcrops of veins by the labor of slaves operating under the direction of the white immigrants. Much of the country during this era was prospected for gold and some parts of it, notably Southern Rhodesia, so thoroughly that but very few new deposits of that metal have since been found. There has also occurred a prehistoric search for copper, but no evidence has been found of ancient silver mines.

Modern mining began with the accidental discovery of the outcropping gold-bearing banket beds of the Transvaal upland in 1887, which had been overlooked by the natives. In 1892 the Rhodesian mining districts became accessible. This proved to be a land already prospected. All that it was necessary for the pioneers to do was to give a suitable present to a native chief, who would then immediately order a runner or guide to take the white man to the nearest old workings not already given away.

The kind of law that has been evolved from these peculiar and unusual conditions is very interesting and quite unique. Prospecting is not considered to be an occupation involving the search for undiscovered mineral deposits, but a business having for its object the relocation of already known outcrops and their preliminary development by means of comparatively shallow excavations to determine whether or not the lode is wide and rich enough to become payable. Hence it becomes simply claim staking, and for the exercise of the act the laws require the taking out of a license. These are available only to whites, vary in cost from one shilling in Natal to ten shillings in Orangia, and are good for one month only, except in Rhodesia, where the cost is twenty shillings and the term a year. In Natal, Rhodesia, and Cape Province these documents are renewable indefinitely at the same cost per term, and in Orangia at half the cost. But in the Transvaal only two renewals are permitted. Any desired

number of licenses may be taken out by an individual. The size of the location varies from fifteen acres in the Transvaal to 150 acres in the Cape, being determined in each case by the size of the unit claim multiplied by the number of them allowed to a legal location. None carry extralateral rights except in Rhodesia, where the claimant is permitted the indefinite pursuit of the one vein upon which the location was made. Everywhere in this group of laws a discovery is a necessary prerequisite to a location.

Exclusive prospecting areas, ranging in size from 15 to 140 acres, and good for terms of 30 days and upwards for preliminary exploration purposes, may be secured in all the provinces except Natal upon reasonable conditions and at moderate expense. The document conveying such franchises is usually called a "prospecting permit."

Neither permits nor licenses carry anything more than prospecting privileges, and the right to make a permanent location within proscribed lines and to carry on development work. But when the location is staked, surveyed, monumented and registered, and the holder desires to produce ore and realize upon it, he must first take out what is called a claim or working license, which is of the nature of a monthly tax ranging from two shillings to two pounds per month on each unit claim in the location from which ore is being taken, according to which province he is operating in, and whether his claim belongs to the alluvial, the precious metal, or the base metal class.

There are no labor requirements in Orangia, the Cape Province, or Natal. In the Transvaal the mining Commissioner must be satisfied that reasonably energetic development operations are in progress or claim licenses may be imposed, whether the property is producing or not. In Rhodesia the alternatives are claim licenses, or sixty feet of development per annum per location (not per unit claim), or the equivalent of the latter in cash. Royalties are demanded on the precious metals only in Rhodesia, and on the base metals only in Rhodesia, Orangia, and the Transvaal, the rates ranging from 1% to as high as 7½%.

Location and registration acts and requirements are rather

elaborate, and in Rhodesia and the Transvaal somewhat complicated and expensive. No titles are given beyond the monthly leasehold, which is maintained in force by the monthly renewal of the Permit or License under which it was initiated, or of the claim license permitting commercial operation, or both, plus in Rhodesia and the Transvaal the annual labor requirements or inspection fee on idle claims.

General mining conditions in South Africa may be summarized as follows: In the Cape Province, Natal, and Orangia the metallic output has never been important and gives little promise for the future. Nearly all the public domain has been alienated for agricultural or pastoral purposes and the inducements to search for mineral on privately owned tracts are slight. In the Transvaal the enormous gold production of the past forty years is thought to have reached its maximum. It will doubtless continue at high figures for some time yet, because promising extensions of the main reef have been proven up and determined to be moderately payable. But no prospectors are in the field, and few new occurrences of either the precious or base metals are being found. In Rhodesia the output is steadily advancing and has been ever since 1905, when the mining law was modified so as to permit individual as well as company operations. Prospectors for gold are a superfluity in that country, for all the lodes carrying the precious metal have been located for centuries. But it is certain that Rhodesia has great undiscovered wealth in other metals, notably those of the rarer class like platinum, chromium, tungsten, tin, etc., which are usually encountered in the primitive rocks so abundant there; and if the laws and customs could be modified so as to attract the real mineral pioneer great material benefits would surely result. The southern end of the African continent was at one time a peninsula projecting from the Antarctic land mass, and later an island like Australia. Much of it has never been submerged since early geological time, and while erosion through countless centuries must have carried away vast amounts of the metals that arose from below into its primitive rocky floor, there are indications that much still remains.

CAPE COLONY

(Law of December 23rd, 1898, with amendments to date of January 1st, 1917)

The State claims the exclusive ownership of the precious metals and precious stones within its boundaries, whether on the public domain or on privately owned land; and the exclusive ownership of all other metals and minerals on the public domain, and also on privately owned land except where the deed of grant of the same expressly passed mineral or underground rights. It will not sell its mineral deposits. But it allows search for them, will grant prospecting areas, and permit the location of claims, which can be converted into mining leases, if desired.

Prospecting is not free. A license is required. The document costs 2s. 6d., is good for 30 days only, but is renewable monthly thereafter at the same price for a total period of 12 months. It carries the right to search for all the metals and minerals on the public domain, and also on privately owned property (the consent of the owner having first been secured) where mineral rights have not been reserved; otherwise, without his consent, excepting on areas covered by buildings, or enclosed and cultivated, or devoted to the public use as parks, cemeteries, townsites and other public utilities. The details of the law may conveniently be considered under three headings, namely, Precious Metals, Precious Stones, and Base Metals and Minerals.

Precious Metals

A licensed prospector may stake off a rectangular area 7500 by 800 feet, and hold exclusive exploration rights therein so long as desired during the life of his license or any extension thereof, provided operations are carried on with reasonable diligence and intelligence. The prospector is required to report promptly (verbally) all mineral discoveries made, whether in workable quantity or not, and when ore is found in payable amount to make a sworn statement to that effect before the nearest Civil Commissioner. Any such discoverer who desires the exclusive possession and full working rights for his "find," and who can

prove to the Commissioner that it is of value, or capable of being developed to such a status, is entitled to stake out within his prospecting area 25 unit claims in a block, if on private property, and 50 of such claims if operating on the public domain, said staking to be done immediately after the proclamation of the region as a "Public Digging" before any other claims are allowed to be staked. Such a location, being the first made in a new region, may be held and operated thereafter by the claimant, free of claim license tax. All subsequent locators have to pay this tax.

The unit mining claim measures 150 feet along the strike or outcrop of the vein, is rectangular in shape, and 800 feet in width, with the right to lay off any part or all of that width as the locator may see fit, so long as the outcrop is included. There are no extralateral rights. No other discoverer's claim is allowed within a distance of six miles on the same lode or vein. After the discoverer's claims are staked, other prospectors who may have been working within the limits of the proclaimed area may locate ground on the same vein, but only to the amount in each case of two unit claims, and as soon as ore extraction begins must pay claim license money monthly in advance.

If the discovery is made on private land, and the Governor for any reason should refuse to proclaim the region as a Public Digging, the discoverer may still stake off the 25 unit claims allowed, provided he can make a satisfactory agreement with the surface owner.

In the case of a discovery made upon Crown land, and the refusal of the Governor to proclaim a Public Digging, the discoverer may demand a lease, the area of which shall be decided by the Governor, but may not exceed 100 morgen (about 210 acres). The term is five years, with the right of indefinite renewals of the same period, and the rental ten shillings per morgen (2.1 acres) per annum, payable in advance.

Claims other than those of the discoverer, desired by prospectors who may have been searching on the proclaimed area at the time of the discovery, may not be staked until the date arrives

for the proclamation to become effective for the general public. Then, any male of legal age and status may stake off up to five unit claims in a block. Within six days these must be registered. No staking is allowed on Sundays or on legal holidays, or between sunset and sunrise. The staking requirements are simple and inexpensive. The government reserves the right to demand surveys on all claims, at the expense of the claimant. Surveying fees are moderate.

The registration of a claim costs 20 shillings, and is good for a month only. Thereafter re-registration must be effected at each recurring monthly date, on each unit claim, and the 20-shilling fee paid. After the first registration conveyancing rights are complete.

When claims are unworked for a period of four months the District Inspector has the right to double the monthly license fee, and after eight months of idleness it may be quadrupled. But upon a showing satisfactory to the Inspector (sickness, for instance), a four month's certificate of protection may be obtained.

A discoverer of a new alluvial field has the right, after he has proven to the satisfaction of the Civil Commissioner that the field is a payable one, and upon its proclamation by the Governor as a public Digging, before any other claims are staked, to take up 20 claims in a block, and to hold and work the same free of license money, so long as all other provisions of the law are complied with.

The alluvial claim is a rectangular area measuring 150 by 150 feet. But upon its being shown that a claim so laid out works a hardship, one of irregular shape may be allowed by the authorities, but the area taken must not exceed 20,000 square feet.

The license fee on all classes of claims is 2s. 6d. per month per claim, except when on private property, when it is five shillings, one-half of which goes to the surface owner.

When a lode is discovered on an alluvial claim the claim holder can have his claim converted into a reef claim if he so desires, and must do so if he intends to mine upon the lode.

All alluvial claims must be re-registered monthly at a cost of two shillings and sixpence per claim. Alluvial claims remaining unworked for 14 consecutive days, excluding Sundays and legal holidays from the count, may be declared abandoned by the authorities.

All gold recovered from the operations of reef or alluvial claims must be registered not later than the second day of the month following its recovery, at the office of the Inspector of the district.

Precious Stones

The prospecting area for precious stones is a circle with a diameter of 1000 yards, in the center of which a stake must be planted inscribed with the name of the claimant and the number of his license. Such a claim may be located only on Crown land. During the prospecting period this stake may be moved at the will of the prospector, so long as his circle does not encroach on the area of some other prospector. To place such a claim upon privately owned land the consent of the surface owner must first be obtained. In both cases a notice of the discovery must be given to the Civil Commissioner within a month, and monthly thereafter a report of the amount of ground washed and the yield of the same must be made to the authorities. The first discoverer of a payable precious stone deposit in rock (a pipe) is entitled to locate 50 claims, and in the case of an alluvial deposit twenty claims, and hold and work the same free of license money so long as he retains the ownership and conducts his operations in accordance with the general provisions of the law. Upon notice to the authorities of the discovery, and satisfactory proof that it is of importance, the area is surveyed by the government, and, excluding the discoverer's block, is marked off into claims 30 feet square and proclaimed as a Public Digging. Thereupon, on the day named for the proclamation to go into effect, the claims in the marked-off area are sold at public auction, either singly or in blocks of not over 20. The purchasers of these must register them at once at a cost of 20 shillings per claim, and re-registration at the

same charge must be effected monthly thereafter to maintain possession and working privileges. Also a monthly claim license is required, payable in advance. The amount of this is 10 shillings per month when the deposit is an alluvial one, and 20 shillings when it is in rock. With each claim an area of an acre in extent is granted for operating purposes, situated outside of the proclaimed tract. No person is allowed to register a precious stone claim unless he can prove his standing as a reputable citizen of the community. A royalty of 1% of the value of the stones recovered is also payable upon declaration, which must be made as in the case of gold.

Dredging areas for gems on Crown land may be obtained. These take the form of leases. A prospecting license is first required, which costs £15 sterling. This confers the right to stake off an area on a public river not to exceed four miles of its length, or if upon a lake, lagoon or marsh, of not more than 200 acres. Immediate registration is required, which is good for one year. After that period, if the ground is retained, it must be converted into a Lease. The area allowable is two miles of a river channel or 100 acres of lake, lagoon, or marsh. The term is three years, renewable up to a total period of 21 years. The rental is sixpence per acre per month, in advance, plus a royalty of 1% on the gross value of the stones recovered, which must be declared monthly.

Base Metals and Minerals

A special prospecting license is required for searching for this kind of mining property. It costs one shilling, is good for a month, and may be renewed at the same cost for a total period of 12 months. Under it on free public land, a prospecting area of 1000 acres may be staked off, or a circular area with a diameter of 2482 yards with beacon stake at center, upon which the locator has exclusive prospecting rights during the life of his license. But he is under the obligation to conduct his operations on this tract with diligence, and to the satisfaction of the Minister of Mines.

Upon the discovery of payable ore on such a tract the discoverer is entitled to stake off a claim of not more than 1000 acres in extent, which must be surveyed at his cost, and upon which he will be given a lease. This lease covers the right to produce base metals and minerals only, and does not allow the production of the precious metals without a further license. Its term is one year, with the right of renewals up to a total period of 99 years. During the first year there is no rental. After that the rental is one shilling per acre per annum, or less, at the discretion of the Minister of Mines. This official may also impose a royalty charge. During the term of the lease, such grants must be operated to the satisfaction of the district Inspector of Mines, in accordance with the regulations of the law. They may be assigned or sublet with the consent of the Governor. During the first two weeks in each year (after the first) in the life of such a lease, sworn reports must be made upon the operations of the year passed, with complete statistical details of production, etc.

NATAL

(Law of November 14th, 1900, amended to date of January 1st, 1917)

The right of mining for and disposing of all minerals on or in land situated in the Province is declared to be exclusively vested in the government of the same, and covers all mineral substances, whether found on the unoccupied Public Domain, or in privately owned land; excepting however where, previously to the passage of this law, the mineral rights have been sold, or alienated in perpetuity.

The law recognizes three general classes of mining claims or properties, to wit:

Alluvial Claims, which are granted for the mining of precious stones and any and all desirable minerals or metals that occur disseminated through the surface soil. Their size is 100 feet square.

Mining Claims, which are granted for the purpose of prospecting and mining for the metals, and other minerals found in

rock in place (excluding coal), beneath the surface. Their maximum size is 300 yards square.

Mineral Claims, which are granted for the purpose of prospecting or mining for coal, oil, gas, building stone, iron stone and such substance.

Each one of these may be applied for either as a prospecting or a mining claim, or the first may at any time be converted into the second.

Prospecting is nominally free to all persons of either sex, if over the age of 16, and of European birth or descent, and such individuals may stake out for surface inspection up to four of either of the three classes of claims, on either public or private land; but no excavation of any kind must be made without first procuring a prospecting or mining license, and application for the same must be made within 14 days of the act of staking.

Prospecting licenses cost one shilling, are good for three months, are renewable indefinitely at the same cost, and permit the location of one claim only. If it is desired to locate more than one claim, additional licenses must be taken out. No more than four such licenses will be issued to an individual at any one time, but such licenses are transferable, and as many as desired may be purchased from others who are willing to sell them.

Prospecting claims must be registered within 14 days of the date of staking. The registration fee is five shillings. A claim so staked and registered gives the holder the exclusive right to prospect within its bounds, but not to sell ore found, nor in any way to realize value therefrom.

Prospecting licenses may be paid for in advance for four terms (of 3 months each), if desired, but for no longer period.

Contiguous prospecting claims owned by one or more individuals may be consolidated into "blocks" of not more than 12 claims each, with not more than four in one line. Such consolidation must be registered, the fee for which is five shillings per claim per three months.

Prospecting claims, from and after one month from date of registration, must be worked continuously, except on Sundays

and public holidays, under the supervision of one white individual of European birth or descent over the age of sixteen, who also must reside on the claim or in its immediate vicinity. The Deputy Commissioner of Mines must be kept advised of the name of such person working or supervising work, and no individual can be so in charge of more than one claim, or more than one consolidated block of claims. Under certain conditions, and at the discretion of the Commissioner of Mines, exemption from these labor conditions can be arranged at a cost of £1 per claim per three-month term.

Prospecting upon unused or unoccupied private land may be done without the consent of the owner, and prospecting claims may be located, but only to the extent of four claims to any individual (except the surface owner), and only two claims can be located on any one line. After the issue of four prospecting licenses to prospect on any given tract of private land, whether said four are issued to one or to more individuals, no others may be issued against the land of that owner for three months.

Surface owners may explore and excavate on their own land without taking out a prospecting license, but may not stake off a claim without first taking out a mining license. On the other hand, there is no limit to the number of mining claims a surface owner may stake off on his own ground.

When it is desired to locate prospecting claims on privately owned land, in addition to the regular fee for such license the applicant must deposit with the Commissioner of Mines the sum of £2 10s., for each and every claim he desires to locate, such money to be held by the Commissioner to compensate the surface owner for any damage that may result from the exploration. This deposit is returnable if no injury is inflicted.

Unless the surface owner consents, the prospector on private land may have only two working assistants while exploring on his claim prior to its registration, or its conversion into a mining claim.

When a prospecting claim is abandoned, all excavations made upon it must be filled up.

The mining Commissioner has the right, at any time, to demand the conversion of a prospecting claim into a mining claim, if, in his opinion, the public interests require it. If this demand is not complied with, and good cause is not shown for the failure to do so, the claim, at his discretion, may be declared forfeited.

All claims of all kinds, must be rectangular in shape.

Stakes may be of iron of one inch diameter, or of wood three inches through, and must stand three feet above the surface. At the top of each a plate of wood or iron not less than six inches square, must be attached and maintained, and on it must be written or painted the name or names of the owners, the date of staking, and, after registration, the registered number of the claim. Also, after survey, and within one month after registration of the same, these must be replaced by solid masonry monuments not less than two feet high. Trenches four feet long and six inches deep must be dug from each corner stake towards the next two corners.

Mining Claims

Not more than four alluvial or metal-mining claim licenses may be taken out by anyone entitled to take out a prospecting license. The cost is two pounds per month for the alluvial and mineral, and one pound per month for the metal claim, payable in advance and renewable indefinitely so long as the other provisions of the law relating to them are complied with. Each license is good for the location of one claim of the class specified, and prospecting licenses may at all times be converted into mining claims on the same terms.

Prospecting and mining licenses are saleable and transferable, so that any individual legally entitled to hold such documents may become the owner of as many as he can purchase from other individuals, in addition to those he can take out himself.

All claims located under such licenses must be promptly registered, surveyed and monumented at the cost of the claimant. Registration fees are ten shillings. Surveying fees are as follows:

For a single alluvial claim	£5- 0-0
For each additional contiguous claim	1- 0-0
For a single metal claim	6- 0-0
For each additional contiguous metal claim	1- 5-0
For a single mineral claim	8- 0-0
For each additional contiguous mineral claim	1-10-0

Mining claim owners in good standing have the right to dispose of any ores or metals taken from their claims, or to reduce them in mills or smelters to marketable products, but before so doing a sworn statement must be made to the Deputy Commissioner of Mines as to the nature of the ore found and to be disposed of, and a sample of it exhibited.

General Provisions

Raw gold or gold dust cannot be used as money to pay for anything, but must be sold to the licensed buyers of the commodity, who are authorized to purchase at stated prices.

Surface owners, working mines on their own ground, are required to pay only half the fees that are due from others.

There are no royalties on metals, minerals, or precious stones produced.

Default for one calendar month in the payment of fees, dues, fines or any other taxes, entitles the authorities to make a written demand for the same, and impose a fine up to two shillings per diem and costs for such part of another calendar month as may elapse without settlement. At the end of the second month the claim may be sold at auction. The government automatically has a preferred lien over all creditors, whether the latter are secured or not.

Conveyancing rights are complete for all registered claims if the instrument of conveyance is recorded. Transfer fee is £1 per claim, plus 2s. 6d. recording fee.

ORANGIA

(Law of June 17th, 1904, with amendments to date of January 1st, 1917)

The right to prospect and mine for any mineral substance in the Province, or to hold mining property, is granted only to white

persons. Aboriginal native Africans, Asiatics, or Polynesians, Colored Americans, Arabs, and Chinamen are debarred.

Precious Metals and Precious Stones

The law recognizes the paramount right of landowners, whose deeds do not expressly reserve to the Province the ownership of precious metals and gem stones, to all underground rights within their lines. They cannot be forced—except through expropriation proceedings—to allow prospecting or mining upon their property. Nor do they require a license to warrant them in conducting explorations upon it themselves, or for others to whom they may give permission. But, before doing either of these things, the local magistrate must be informed of the intention, whereupon the government automatically acquires the right, at any time, after three days' notice to the owner, to proclaim the area a "Public Digging."

On all other lands within the Province, including alienated lands where the mineral rights have been reserved in the grant from the Crown, a prospecting license is required. This is obtainable from the local Magistrate at a cost of 10 shillings, and is good for a calendar month. Thereafter it is renewable indefinitely at a cost of five shillings, payable monthly in advance. It conveys only the right to prospect and explore up to the point of producing mineral, but ore so produced cannot be sold, milled or smelted, or in any way turned into money (except by the sale of the claim and all upon it), until a claim license has been taken out.

The unit lode mining claim, which applies to all varieties of lodes, veins, or deposits in rock in place, is a rectangle measuring 150 feet along the outcrop, and 400 feet across it.

The unit alluvial claim is a rectangle measu ing 150 feet on each side.

The first discoverer of a mineral deposit of the first class on private land has the right to stake up to 75 of such unit claims, provided they are laid out so as to leave no vacant spaces between, and in the form of a rectangular block whose length does not

exceed twice its width, and provided the block so formed does not exceed in area one-twentieth of the area of the private tract in which the discovery is made.

The first discoverer of an alluvial deposit on private land, has the right to stake up to 20 claims of the second class, to be laid out in a rectangular block as in the former case, and also provided the area does not exceed a similar proportion of the tract.

In both these cases the discoverer may work his claim and realize upon his product, without payment of any claim license money, so long as he remains, in good faith, the actual owner thereof. But to maintain that right his prospecting license must be promptly renewed monthly in advance.

To prospect upon Crown land an application must be made to the Lieut. Governor, specifying the area desired. Whereupon, at the discretion of this official, and upon terms and conditions mutually satisfactory, an exclusive right to explore the same may be obtained. The law provides no other way for the exploration of the public Domain.

A discoverer operating under such a franchise or concession, has the right to locate 51 claims of the first class and 25 of the second. In both cases to be laid out in a compact rectangular block, whose length does not exceed twice its width. So long as such discoverer or discoverers remain the actual sole owners of the ground so located, they may extract mineral and realize on the same without payment of claim licenses.

All such discoveries hereinbefore cited must be reported to the local Magistrate within 30 days.

When any such discoveries are made, the region is at once visited by an official called a Mine Inspector. If, in his opinion, it is of importance, the Governor has the power and is under obligations to proclaim it a "Public Digging," to be thrown open at a certain date. If, however, the Inspector reports that the discovery is of minor importance, and not likely to result in the development of payable ore or ground in any quantity, the matter is left in abeyance.

During the interval between the proclamation and the date set for opening a "Public Digging," the discoverer on Crown land has the right in addition to the 51 claims he has already located, to stake out an area called a "mynpacht." The size of this grant is determined by the agreement previously made between the prospector and the Lieut. Governor.

During the same interval, when the discovery has been made upon private land, whose precious metal and precious stone rights were not reserved by the government when the tract was alienated, and where the owner himself has conducted explorations or permitted others to do so, the said owner has the right to locate for himself a "mynpacht" the extent of which must not exceed 75 claims, nor one-tenth of the area of the tract. But before doing so he must take out a prospecting license at its regular cost of 10 shillings, which is renewable monthly up to a total period of 20 years, at the same price. In addition, the owner has the further right to locate another block of claims up to 75 in number, provided that number does not exceed one-twentieth of the area of the tract. On this block the usual claim license fees are payable.

No such privileges as these accrue to land owners in whose deeds the precious metal and precious stone rights have been reserved.

When an area has been proclaimed as a "Public Digging," has been duly advertised, and the first discoverer has exercised his rights, the surface owner (if it be on alienated land) has staked off the areas allowed him, and the date has arrived for the public opening, two procedures may be followed by prospectors who may desire to make other locations.

Upon private land, the law provides that during the period between the proclamation and the date of opening, all prospectors who desire to locate claims on the proclaimed area may register their names on a public list which is posted on the bulletin board at the office of the local Magistrate, each such registration to be accompanied by a fee of 20 shillings. When the opening day arrives each prospector is allowed, in the order in which his name

appears on the list, to locate up to 50 claims of the first class, or up to three of the second.

Upon Crown land, during the period between proclamation and opening, the government surveys out the land in blocks of six claims each, which upon the opening day are sold at auction to licensed prospectors.

As soon as a claim or block of claims is staked out, and possession given, claim licenses become due. These are, for a claim of the first class five shillings per month, and for the second class 20 shillings.

All claims must be surveyed at owner's expense within six months of the date of the first claim license, and a plat of the same, in triplicate, approved by the Surveyor General, and bearing a stamp of the value of ten shillings, must be filed with the local Magistrate.

Within three days of making a precious metal or precious stone discovery of any kind, the discoverer must report the fact to the local Magistrate, and file with him a sketch plan showing, as nearly as possible, the situation and surrounding land marks.

The production of and realization upon ore or metal found may begin any time after payment of claim licenses, but not before.

As soon as production and realization occur, claim licenses of the first class advance to 20 shillings per month, but are reduced to five shillings when production ceases. There is no change under similar conditions as to claims of the second class, as they are supposed to be productive from the start.

If a claimholder neglects development, his claim license, at the discretion of the Mine Inspector, may be doubled, and continue doubled until reasonable development work is begun.

Failure to pay claim licenses promptly in advance each month gives the authorities the right, after due and reasonable notice, to declare the claim forfeited.

Forfeited claims are sold at auction, and all cash received, after deducting all dues and fines in arrears, is divided equally between the government and the former owner.

Base Metals, Coal, Oil, Sulphur, Salt and All Other Desirable Minerals and Substances

These, when found on alienated lands, belong without reserve to the owners of the same. The government makes no claim of any kind upon them, and the permission of the surface owner must be obtained to search for them. No prospecting license or claim license is required. The prospector deals directly with the surface owner.

If it is desired to prospect for them on Crown land, the prospecting license costs 2s. 6d. on application, and five shillings per month thereafter. To secure exclusive prospecting rights over any given area, an application must be made to the Lieut. Governor, who will grant rights subject to such conditions as he may deem proper. The law makes no provisions for filing claims on discoveries of these substances, and imposes no claim license. In lieu thereof a royalty on the gross value of the metal or material won is imposed, which is never less than 2½%.

All discoveries on either class of land must be reported within 60 days to the local Magistrate.

The government reserves the right to levy a tax on all mining properties of this class, in addition to royalty, the same, however, never to be in excess of 1½% on the gross value of the metals or minerals produced.

General Provisions

On precious metal and precious stone claims a procedure called "Special Registration" is required within three months after production begins. The costs are moderate, and the process simple. When completed, the title is incontestable except for fraud, so long as claim license payments are promptly met when due.

No claims of any kind may be located on Sundays, or on public holidays, or between sunset and sunrise.

Alluvial claims may be located and worked on top of the other class of claims, provided proper security is given to the owner or

owners of the latter, to cover possible interference or damage, or their permission is secured.

Conveyancing rights are complete on all claims that have been surveyed, and the fees for recording the same are reasonable.

Individuals may hold by purchase an unlimited number of claims.

Claims cannot be abandoned without first informing the local Magistrate of the intention, and filing with him a map of the premises approved by the Surveyor General and bearing a stamp of ten shillings.

Prospecting and mining are prohibited within 200 yards of any building, public park, reservoir, ditch, railroad or other public utility, or of a cultivated area.

Raw gold cannot be used as money, nor may it be legally acquired in any way from a person of color.

It is illegal to prospect or mine for any base metal or any other mineral—except gold, silver, or gems—upon a precious metal or precious stone claim.

Water rights are obtainable at reasonable cost, and title to the same are maintained by reasonable usage.

Explosives may be purchased only by securing a permit from the local Magistrate, which permit must bear a stamp of one shilling. They may be used only by individuals holding a "blasting certificate." This is issued, free of charge, to any party who gives satisfactory evidence to the Chief Inspector of Mines that he knows how to handle explosives safely.

SOUTHERN RHODESIA

(Law of 1903, with amendments to date of January 1st, 1917)

By virtue of an agreement with the government of Great Britain, the right of searching and mining for, and disposing of all metals, minerals, and mineral oils throughout the entire territory of Southern Rhodesia, whether found upon unoccupied land, or upon land the surface of which has been alienated, is vested in the British South Africa Company, which also governs and administers the country.

This corporation does not grant fee simple titles to its mineral lands, but, subject to the provisions of the mining law and the regulations thereunder, grants usage of the same, with full rights to recover, dispose of, and realize upon all values that may be found therein.

Prospecting is not free. But any individual of legal age and status, of either sex, or the agent of a company legally authorized to do business in the country, may take out any desired number of Prospecting Licenses, at a cost of £1 each. Every such license conveys the right to prospect in any part of the country not already occupied for mining purposes, to stake off one mining location, consisting of ten or less unit mining claims, or one alluvial claim, or one claim of any other class of mining tenement, and to explore the same; and, after they are registered, to sell, and make all other usual conveyances. Such transfers, however, must be made through the proper offices of the B. S. A. Co., for which a small fee is charged.

Areas exempted from prospecting are the usual ones, such as public squares and parks, cemeteries, native kraals (towns), and land under cultivation or otherwise improved, or used as ditches, reservoirs or roads. Nor may the prospector operate nearer than 500 yards to a homestead and its appurtenances, or than 200 yards to *any* building, except with the written consent of the owner thereof.

In conducting his operations the prospector, having selected an unoccupied area, is first required to post conspicuously a "Notice" thereon, entitled a "Prospecting Notice," upon which is written his name, date of posting and number of license. When this is done it confers the exclusive right, for the succeeding 31 days, to prospect within a circular area with a radius of 1000 feet from the notice.

If a promising discovery is made within such an area during the period named, and the discoverer desires to acquire possession of it, he must plant a post at the discovery place inscribed with the initials D P (discovery post), and also, before the expiration of the term he may stake off a location or block of

ten unit mining claims, within which block must be the D P post. This block in shape must be a parallelogram not over 1500 feet in length and 600 feet in width, with substantial stakes or stone monuments at each of its four corners and at the centers of the end lines. It is not required to erect stakes at the corners of the unit claims of which the block or mining location is composed. Following the staking a registration notice must be posted, upon which is given the name of the claimant, the date of posting, the number of the license under which the location is made, a sketch plan of the location showing its shape and the length of the center and end lines, and, as closely as possible, the cardinal points of the compass. The location must always be laid off with its length along the strike of the vein, and upon each of its six stakes must be inscribed the number of the license under which it is claimed.

Within 31 days thereafter a copy of both the prospecting and registration notices must be filed at the office of the nearest Mining Commissioner, together with a sketch plan of the claim indicating approximately its position with respect to surrounding landmarks. The recording fee is five shillings. At the same time the principal metal or metals or minerals for which the claim is to be worked must be named, and the license under which it was located surrendered. In consideration of the performance of all these things the claimant is given a "Certificate of Registration," which is prima facie evidence of his title. Within four months thereafter all the location stakes must be replaced by temporary stone monuments (not necessarily of masonry), not less than two feet high and four feet in diameter at their base, from the center of the top of which must project a wooden or iron stake to the height of two feet more, to which must be attached a plate of metal or wood not less than nine inches square, bearing the name of the claim and all the data given on the prospecting notice. Claims may be located on any day of the year, but not during the hours between six P. M. and six A. M. standard South African time.

A mining location so made gives the holder thereof, so long as

the title thereto is maintained in accordance with the further provisions of the law, the right of mining all lodes or reefs within the boundary lines projected downward vertically to an indefinite depth, and also the extralateral right of pursuit of the lode upon which the discovery was made, between vertical planes passing through the end lines of the claim indefinitely extended both horizontally and vertically. The holder has also the exclusive right to the ownership of any alluvial gold or other metal that may be found on the surface, and to the use of the surface within his lines. But the right to produce and realize upon ores or metals revealed by development work is not yet granted, and does not accrue until a tax called "claim license" is paid, as hereafter detailed.

Within four months after registration at least 30 feet of development work (sinking or drifting) must be done. During each calendar year succeeding the end of this four-month period, the claimant must execute at least 60 feet of development work on his ground, must make a sworn statement to that effect, and file it with the Mining Commissioner, accompanied with a fee of ten shillings. In return, a document termed an "Inspection Certificate" is issued to him, which has the effect of protecting the title to the location during the following calendar year.

The unit lode mining claim is nominally a rectangular parallelogram, the maximum length of each of the two shorter lines being 150 feet, which must be laid out in the supposed direction of the course of the lode, and which is called its length, and of each of the shorter sides 600 feet, laid out at right angles to the others, and called the width. Any number of these not exceeding ten, adjoining each other on their long sides, may be located as a "block" or "mining location," under the right conferred by the prospecting license. When the block or location includes the full ten unit claims permitted, it forms a rectangular parallelogram measuring 1500 feet on its longer sides, and 600 feet on its shorter. For all purposes connected with the maintenance of title and of development, the block of ten or less unit claims is the unit considered. But when the production of ore begins, a

further form of permit is required as stated above, which is called a claim license. For this, the unit claim of 150 by 600 feet is the basis of all calculations. This license must be paid on all such unit claims from which ore is being extracted, but is not demanded upon those which are not yielding any material of value.

The unit alluvial claim is a rectangle 200 feet square. Only one of these may be taken under the authority of a prospector's license. There is no such thing as a block of alluvial claims, but a prospector may locate as many of them as he chooses, provided he holds an equal number of prospecting licenses. Each one—although they may adjoin—must be staked in the same manner and with the same notices and other formalities as in the case of a lode location, and registered within 31 days thereafter. Registration fee is five shillings. At the same time the claimant must take out a license to work. This document costs five shillings, and is good for 30 days only. It is, however, renewable indefinitely at the same cost, provided the ground is worked continuously, except on Sundays and legal holidays. All gold or other metal or mineral recovered from the operations must be declared to the government monthly, and a royalty of 2½% paid thereon.

All registered mining locations are, by the terms of the law, held by the owner thereof on joint account with the British South Africa Company—called familiarly the Chartered Company—in the proportion of 70% to the former and 30% to the latter; and, except as to alluvial claims, or other claims for which special provisions are made, no metals or ores of any kind may be taken away from them and realized upon in any manner, until such time, and upon such terms as may be mutually agreed between the two partners. To this end, any claim holder who desires to begin the production of ore is invited to submit to the Chartered Company the details of a scheme by which the interest of the Company may either be discharged, or otherwise taken care of. This takes the form either of the organization of a public company and the delivery of 30% of its capital stock to the Chartered

Company; or of an agreement to develop, equip, and operate entirely at the expense of the claimholder, and pay to the Chartered Company in perpetuity an agreed percentage of all values recovered. If either of these programs is accepted the requisite authority is granted, and thereafter, as long as the provisions of the contract entered into are observed, the claimholder possesses all the privileges of an actual owner. In the event of an arrangement of the second class being entered into, the royalties range from 2½% to 7½% on the gross value at the mine of any and all metals and minerals recovered according to circumstances, and are payable monthly.

In addition to stock received in commutation of its 30% interest, in all cases where property is capitalized, and also in addition to royalties in lieu of the same when properties are developed, equipped and operated solely at the expense of the claim holder, the Chartered Company reserve the right to impose and collect the tax called the "claim license" on all ground where permission has been granted to mine in either way, amounting to 10 shillings per month. For a full block of unit claims of the dimensions of 1500 by 600 feet, this tax amounts to about $450 per year, but is payable only for such unit claims as for the time being are producing. Again, under certain conditions, the tax is reduced to five shillings per month, and during periods of time when production ceases altogether, either from exhaustion of ore, or the injury or destruction of part or all of the equipment, or other proper causes, exemption altogether may be secured. In such cases, however, annual inspection fees on each block of claims must be paid, or labor to their equivalence performed.

The right to a mining location carries with it the exclusive use of the surface thereof for all bona fide mining purposes, but if it is desired to open a store thereon and transact a general merchandise business, a license to do so must be procured.

After the registration of a mining claim the right to sell or encumber it is complete, provided the grantee in the transaction is legally capable of receiving the title, and provided also that the

transaction is conducted in the office of a Mining Commissioner, and under the formalities and regulations provided. A document evidencing a sale costs £1, and in case the consideration is in excess of £100, there is a transfer fee of 1% of whatever may be the excess.

Mining locations that have not been registered may be abandoned by simply withdrawing the stakes and posting a notice of abandonment on the post where the first notice was placed. But after registration a "Certificate of Abandonment" must be taken out at the office of the Mining Commissioner, at a cost of £1.

The holder of a registered mining location may locate residence, mill, tailings or reservoir sites, or areas for any other purpose legitimately connected with mining, not exceeding a total of five in number, and not covering a total of more than 100 acres, upon any ground adjoining or in the vicinity of his claim that is still unoccupied, and without the purchase or usage of prospecting licenses to represent them. All such areas must be staked, posted with notices and registered in the same general way as with mining locations, but the right is reserved by the government to reject such locations if in its opinion there is just cause for doing so. If, however, the tender for registration is accepted by the Commissioner of Mines, certificates of registration will be issued which will cost at the rate of £1 per acre of area, and thereafter rental at the rate of five shillings per acre per month is required. Every site or tract so accepted and registered is thereafter inalienably attached to the particular mining location for the use of which it was taken out, and the title thereto passes with that of the claim. Upon and under such sites the claim holder acquires all mining rights except that of the extralateral pursuit of veins therein.

The right to prospect for the base metals as well as for all minerals is included in the privilege resulting from the possession of a Prospector's License. When a location is made the processes of staking, notice posting, registration and maintenance are similar to those already described for gold; and when locators of property of this kind are ready to produce—or "work for profit"

as the law expresses it—the prospecting area is convertible into a mining location in the same way. But when this point is reached the details for further procedure vary.

What is called a "copper location," and which appears to apply to all base metals, may be staked off in any necessary shape so long as the boundaries are straight lines, and has a maximum area of 30 unit claims instead of 10, covering therefore approximately 63 acres. The registration notice must mention the metal or mineral which is expected to be found and worked for. The registration fee is £1.

Ore extraction can begin at once or at any time, but as soon as it does, claim license money is due at the rate of £5 per claim per month for the claims producing mineral. In addition, royalties on the gross value of the output at the mine are demanded as follows:

On Bismuth, Cobalt, Copper, Mercury, Molybdenum, Nickel, Thorium, Tin, Tungsten, Uranium, and Vanadium; also on mineral oils, gas and salt, at the rate of 3%, payable monthly.

On Antimony, Asbestos, Barium, Strontium, Chromium, Graphite, Gypsum, Iron, Lead, Magnesite, Manganese, Mica, and Zinc, at the rate of 2% monthly.

THE TRANSVAAL

(Law of August 22nd, 1908, with amendments and additions to date of January 1st, 1917)

The State claims the exclusive ownership of gold and silver, wherever found within its boundaries, without any exceptions; and of all other metals and minerals except where they occur on alienated land where mineral rights have not been reserved in the grant from the Crown. All Crown lands, therefore, which are not already occupied as mining properties, are open to prospecting and exploration for all the metals and minerals, and also all privately owned land, excepting when in use for residential or cultivation purposes, unless the owners themselves are already mining upon them, and unless the original grant under which

they are held failed to reserve the ownership of the base metals and the valuable minerals.

Prospecting is not free. But any white person over the age of sixteen, and any legally incorporated company, may obtain what is called a "Prospecting Permit," good for 12 months, and for the precious metals only, at a cost of five shillings. This gives the holder the right to stake out one area measuring not more than 2000 ft. square, upon which, so long as operations are conducted to the satisfaction of the local Mining Commissioner, and are confined solely to prospecting and exploration, without production, exclusive rights are granted. Such areas, however, may not be selected within the limits of any town, public park, cemetery or other public reserve; nor within 300 feet of any spring, well, stream, reservoir or water works, or within 600 ft. of any building.

Moreover, after the areas have been selected and staked, prospecting must not begin until, after notice in the government Gazette, and advertising in a newspaper circulating in the vicinity (if any), the Minister of Mines has declared it open.

If the area desired is upon alienated land, the application for the "Prospecting Permit" must be accompanied by the written consent of the surface owner.

All discoveries made upon such areas must be reported to the Mining Commissioner within 14 days. If, upon examination, this official considers the discovery of sufficient importance, he will give the holder of the "Permit" a document, authorizing him within a stated period (not to exceed 30 days), to stake out his claims within the area covered by the "Permit."

The size of the unit claim is 150 by 400 feet. If the discovery has been made upon private land the permit holder may stake an area which must be at least the equivalent of 10 of these units, but may not be greater than the equivalent of 50 of them; if on Crown land, the minimum is the equivalent of 25 units, and the maximum the same as in the other case. A further rule prescribes that the block of claims, when staked, must be rectangular in shape, with length not greater than twice its width;

and, finally, it must not comprise a total area greater than one-ninetieth of the total area which is to be proclaimed as a result of the discovery, or, as the law puts it, the equivalent of "one claim to every sixty morgen," the "morgen" being approximately 2.1 acres.

As soon as the selected area is staked, the permit holder is entitled to demand a "Certificate" conferring the exclusive right to prospect and explore upon it for a period of three years from its date, without the payment of any claim license fees. But this certificate does not give the right to extract and realize upon any ore that may be found; and further, if in the opinion of the Mining Commissioner operations are not carried on with sufficient energy, claim license money may be imposed by that official. In any event, these become payable at the end of the three year term. But the claimant may begin production and realization at any time within the term, by beginning the payment of claim licenses.

Before ordinary mining claims, other than those already described which are known as "prospecting mining claims," can be located by anyone, the ground must be proclaimed as a "Public Digging," by act of the Governor, and after a due course of public notices and advertising. After such proclamation no more "prospecting mining claims" may be located upon it, but only ordinary mining claims. All such proclaimed areas are carefully monumented by the government, so that their boundaries may be easily traced by any one. Even then it is optional with the Governor either to throw the region open to public location, or to lease the whole or any part of it to individuals or corporations, or to reserve it as a State mine, to be developed and operated under the supervision of the government Mining Engineer. Finally, he possesses the power, under the advice of the latter official, to withdraw the land, or any part of it, but in so doing may not affect injuriously any of the rights that have already been acquired upon it.

Mining claims may be staked only by individuals over 16 years of age, who are of white color and ancestry, and who are in

possession of a document called a "prospecting license." Such licenses are sold by the government to duly qualified persons, good for the location of one or more claims (but not to exceed fifty), according to the number expressed on their face, at the price of 2s. 6d. per claim if for use on Crown land, or five shillings per claim if to be applied on privately owned areas. Every such license expires in 30 days after its issuing date, but is renewable at the same cost twice. The staking of claims on Sundays or public holidays or between sunset and sunrise is not legal.

All mining claims staked by virtue of such licenses must be rectangular in shape, must measure 150 by 400 feet each, must be contiguous if blocked, and the block must have a width not greater than half its length. Furthermore, when staked upon a lode, the short side of each claim must be parallel with the assumed outcrop or strike of the vein, and the long side across it. No extralateral rights exist. The outcrop may be located at any distance from the short sides of the claim (but within it) that the locator desires.

The act of staking must be reported at the office of the nearest Mining Commissioner within two to fourteen days (according to the distance from that office), and seven days thereafter permanent stakes must be erected at all external angles. Within one month the claimant must present to the Mining Commissioner a sketch plan of the claim and its vicinity, and a certificate from the hand of an official called a "Beacon Inspector" to the effect that the stakes are properly set and in order. Under certain conditions the Commissioner has the right to demand a survey.

On ground so located and approved, three months' time is given free of claim licenses to explore and begin production, and if good cause is shown a second term of the same length may be granted on payment in advance of the fees first paid. At the end of this second period however, and in any event as soon as production begins, the "prospecting license" must be converted into what is called a "digger's license," and thereafter, continuously, claim licenses become due and payable in advance

at the rate of 20 shillings per month per claim as long as the property is held. No further title is granted, and the ground may be declared forfeited by the Mining Commissioner at any time, upon default of the prompt payment of the monthly fees.

The surface area of a mining property so acquired can only be used for purposes properly incidental to the natural operations of mining, and to those of the beneficiation of the ore produced. It may not be fenced.

When base metals are found in a mining claim the Minister of Mines must be at once advised of the fact. This official may then, at his discretion, allow the discoverer to stake out up to 100 unit mining claims of 150 by 400 ft. in size, upon payment as a claim license for them at the rate of one penny per claim per month thereafter; but on an area so granted, mining for the precious metals must be carried on only upon fifty of the claims so taken.

A royalty of 1% of the value of all base metals recovered is demanded by the government. No royalty is collected on the precious metals.

RESULTS

Metal production in South Africa dates from about 1879 when parcels of copper ore began to come to Swansea, Wales, for reduction, from Namaqualand on the west coast about 500 miles north of Capetown. In 1887, the gold mines of the Transvaal began their remarkable career, and in 1899 silver-lead ores were first exported from Beira on the east coast. Since then there have been intermittent shipments of tin, tungsten and chromium ores from various points in the Union of South Africa and Rhodesia, but not in sufficient amount—except as to chromium—to be notable. This part of the world has not as yet any metallurgical industry beyond the individual plants at the gold mines, and consequently, though the common base metals such as copper, lead, zinc and manganese are abundant, there is no market for their ores nearer than Europe or America.

The metallic output of this field, from 1879 to the end of 1916 has been as follows:

Metal	Term	Totals	Annual average	1916
Copper.....	38 years	$ 119,750,505	$ 3,151,329	$ 19,974,400
Gold.....	30 years	2,763,686,779	92,122,892	210,404,000
Silver.....	18 years	7,302,978	405,721	750,000
		$2,890,740,262	$95,679,942	$231,128,400

These figures show that the industry is in a flourishing condition, the gains of 1916 over the averages for the several periods having been 534% in the case of copper, 128% in the case of gold and 85% in silver. Because it has consisted mainly of gold the South African production has not been affected so much by the abnormal prices for the metals that prevailed during the last three years of the term, though the large increase in the value of the output of copper in 1915 and 1916 was wholly due to this cause, as will be seen by an examination of the following table which contains no figures later than those of 1913.

South Africa, 1879 to 1913: Cape Province, Namaqualand, Natal, Orangia, the Transvaal and Southern Rhodesia

Metal	Term	Years in term	Total product of term	Average annual product during term	Product of 1913	Gain (+) or loss (−) in 1913, as compared with average
Copper....	1879 to 1913	35	$83,921,005	$2,397,743	$5,740,353	+140%
Gold.....	1887 to 1913	27	2,156,091,952	79,855,257	196,045,566	+145%
Silver.....	1899 to 1913	15	5,412,978	360,865	609,625	+ 69%
			$2,245,425,935	$82,613,865	$202,395,544	+144%

CHAPTER XI

THE EUROPEAN SYSTEMS OF MINING LAW. DIGESTS OF THE MINING LAWS OF AUSTRIA-HUNGARY, FRANCE, GERMANY, GREAT BRITAIN, ITALY, NORWAY, PORTUGAL, RUSSIA, SPAIN, SWEDEN, TURKEY, AND SERBIA. RESULTS OF THE SYSTEMS. STATISTICS OF PRODUCTION FROM 1901 TO 1913

THE EUROPEAN SYSTEMS

In Europe no public land remains, that is to say, land which can be purchased from the government as may be done in the United States, Canada, Australia, and throughout much of Central and South America. This has been the condition for many centuries. In Russia, Austria, Germany, and probably in several other of the nations, the hereditary rulers are vast landed proprietors, and much of their holding can probably be considered as State land, and will doubtless become so when their era passes away. In consequence of these conditions the mining laws in force are only of the kind that have been found necessary to compel land owners to allow prospecting on their property, and when a discovery is made to give the discoverer or his assigns the right to mine. This has been attempted in various ways, and has met with varying degrees of success. At the time of the break-up of the Roman Empire the doctrine that the surface owner was also the exclusive owner of everything under his tract had become firmly established, and this view is still rigidly maintained in Great Britain and has been transplanted to the United States and Canada. On the Continent it passed away early in the nineteenth century, under the intellectual lead of France. In its place was installed the doctrine that undiscovered mineral

was "res nullus," and hence belonged to the body politic or the ruling sovereign, in whom resided the right to make concessions thereof, in accordance with legislation enacted by Parliaments, or decrees promulgated by autocrats. These generally have taken the form of long term grants, by which the authorities have disposed of the mining rights to those who first applied for them after making a discovery, leaving the concessionaire to negotiate with the soil owner if possible for such surface ground as might be needed to carry on operations properly. In addition, in several States, the government is itself a large operator of mines.

Under such conditions there is naturally very little scope for the activities of prospecting. New discoveries are rare occurrences. Mining is everywhere regarded as a business requiring the outlay of large capital and the guidance of high technical knowledge and experience. Excluding coal, mineral oil, iron and salt, the mineral production of Europe is small as compared with that of other grand divisions of the world. Nearly all of the metal recovered annually comes from mining districts and mines that have been known for hundreds and even thousands of years, having been discovered in those far off days when the population was relatively sparse, settlements few and far between, and unoccupied land abundant.

The digests that follow will be found interesting and instructive. That there are yet vast undiscovered mineral resources in Europe is confidently believed by those who are best acquainted with its general geology. These cannot become available until discovered. They will not be brought to light by scientists or capitalists. It is doubtful if the business of prospecting will revive until great changes have occurred in social as well as political conditions. A realization of the "impasse" that exists especially in Great Britain, may lead to an understanding of that which might in due time be reached in our own country if meantime the laws in regard to real estate are not fundamentally modified.

AUSTRIA-HUNGARY

(Law of May 23rd, 1854)

Prospecting, even by the surface owner on his own ground, is illegal without a permit from the authorities, under the doctrine that all undersurface mineral substances belong to the State. Permits, however, are freely issued at nominal cost, good for a year and renewable thereafter from year to year indefinitely, but are not exclusive, and carry no rights beyond that of surface inspection on privately owned land. An exclusive right to develop and explore underground, called a "Freischurf," can be obtained for a circular tract with a diameter of not more than half a mile, by the planting of a notification stake at its center, followed by immediate notice to the Director of the Department of Mines, and formal application in writing for the area so delimited. This is recognized and protected by the authorities so long as they continue satisfied that intelligent and energetic exploring and developing work is in progress, and after registration the temporary title so inaugurated is transferable.

Within the tract thus held the explorer may at any time during the legal period of his occupancy, claim the preferential right to a permanent mining area, provided he is able to satisfy the authorities that a new occurrence of valuable mineral has been found by him within its lines, and that it can be worked at a profit with the means at his command. The unit claim is a tract enclosing about 10 acres of surface, placed as desired by the concessionaire so long as it is wholly within the limits of his prospecting area. With it goes the right to produce and realize upon the value of all mineral substances found vertically beneath, and without further obligations of any kind to the government, except the usual forms of taxation, or to the surface owner. Nine of these units may be combined into one group (18 in the case of a coal mine) and any desired number of such groups may be legally located and held by an individual or company by following the procedure outlined. Maintenance requirements consist in practically continuous work to the satisfaction of the Department of Mines.

The latter also will grant to the first applicant a right to operate alluvial deposits lying above the surface of the bed rock, upon any area not already occupied by an underground mining franchise, or by public or private buildings, or other surface improvements, the size, term, and other details of which are wholly matters of negotiation between the applicant and the authorities.

In all cases the surface owner has the right to claim indemnity for damages of all kinds resulting from the operations of the miner, and for the loss of the use of the land necessarily employed by him for buildings, dumps, beneficiating works, and other proper mining activities; and under certain exceptional circumstances he may compel him to purchase or pay rent on such areas, if, in the opinion of the authorities, no other method of indemnification would seem equally just.

FRANCE

(Law of April 13th, 1810, as amended April 27th, 1838, January 16th, 1840, May 9th, 1866, July 27th, 1880, and January 23rd, 1907)

Mineral substances of all kinds are divided into three classes, called respectively Mines, Placers, and Quarries.

Mines.—Combustibles (coal, oil and natural gas); ores of the Metals when occurring in rock in place; deposits of sulphur, alum, rock salt, baryta, fluorspar and in general all other minerals usually found in bodies which extend into and below the surface of the bed rock.

Placers.—Metalliferous alluvials, and all desirable minerals (except Quarries) occurring in the surface soil as parts of it, and of its nature, and not extending from it into and below the surface of the bed rock.

Quarries.—Building stone, limestone, peat, clay, and analogous substances that may be operated by uncovered excavations.

Materials of the first class belong exclusively to the State, and may be searched for and worked only under the provisions of the law. Placers and quarries belong to the owner of the surface, but all operations thereon may be conducted only with the knowledge and under the supervision of the authorities.

Prospecting is not free; a permit must be obtained from the government, and also the permission of the soil owner; but the latter may prospect without a permit on his own land, or enter into arrangements with another to do so. But in both cases the owner must first notify the authorities of his intentions. When it is desired to explore on property where the owner will not voluntarily give permission, a special permit can be obtained from the Department of Mines.

No form of prospecting permit conveys the right to remove and realize upon ore found, nor to search for other substances than those specifically mentioned in the document. Nor are these permits transferable. Further, they are issued under the general theory that within a reasonable time after a discovery has been made the holder will apply for a grant or concession for the territory believed to be valuable. If, however, before doing so, he desires to remove and realize upon some of the material found, for the purpose of ascertaining its value in bulk, or for other legitimate purposes having a bearing on the application for a concession, a permit authorizing such removal and sale will be granted by the Préfet of the Department. All prospecting operations are at all times under the surveillance of the authorities.

To obtain a concession for mining purposes an application must be made to the Préfet giving the name and address of the applicant, the area of ground sought and its situation as displayed on a map made to a scale of 1 to 10,000 at the cost of the applicant. This, when presented, is signed, dated and recorded, and a receipt given for it. Any number of such applications, made by any number of individuals as well as by the discoverer, may be filed, and will be considered. Priority of filing, even by the discoverer, gives no preferential rights, and the government reserves the right to reject all or to select any one of them. But if the concession is granted to any one but the discoverer, the latter must be suitably indemnified to the satisfaction of the authorities for both his labor and costs, and in addition, in proportion to the importance of his "find," by the concessionaire. The latter

must satisfy the government as to his capability to operate economically and with sufficient capital. A deposit of cash to an amount set by the Préfet must then be made, to cover the costs of investigation of title, verification of the map, advertising, etc.

Upon the acceptance of an application a notice describing the area applied for is posted for two months in the office of the Préfet, and a copy of it published for 30 days in the Official Gazette, and also in one of the public papers of the vicinity if there are any. During this latter term all objections to the granting of the concession must be formally lodged with the Préfet. At its end all the papers go to the Minister of Public Works for final consideration. This official has the right finally to reject if, in his opinion, the payability of the property has not been sufficiently demonstrated. If granted, a decree to that effect is published, and the claimant is formally placed in physical possession of the ground.

The right thus initiated covers only under-soil operations. In the eyes of the law it is real estate, transferable—together with all its legitimate surface appurtenances, such as buildings, machinery, etc.—by common law deed, but all such deeds must be approved by the Department of Mines and carry the signature of its Chief to be valid. It includes no surface rights. Such as are necessary must be secured from the surface owner, but the law provides means by which these may be obtained on reasonable terms. If the ground is rented the owner cannot claim more than double the net revenue that he can show it has been yielding. If purchased, the price cannot exceed double its value as appraised for taxation. Under any and all arrangements, however, the owner can insist upon adequate support for his surface in all its parts, unless this right is specifically waived.

Mining grants are good only for the substance or substances listed therein, but when unlisted substances are found in such chemical or mechanical combination with listed ones as to make their simultaneous production and recovery an economical necessity, a permit will be given allowing their extraction.

Concessionaires must monument their ground and maintain the monuments in good repair. When these are an injury to the surface owner he must be properly indemnified. Shafts cannot be sunk or levels driven nearer than 50 meters to buildings without first giving their owner 30 days' notice, during which term the latter must make formal demand through the courts, if necessary, for security for possible damages.

Mining grants cannot be united without the permission of the Council of State. Nor may they be abandoned without giving notice of the intent to the Préfet and awaiting his permission, which is given only after due formalities for the protection of creditors, and an expert examination and survey of the mine.

The government claims an annual ground rent of one franc[1] per hectare of area, except in the case of coal mines when this tax is reduced to 30 centimes per hectare. But this impost does not begin until January 1st of the third calendar year of possession, the first two years being free. In addition, a royalty of 6% of the net profits must be paid each year for the business of the previous year.

The area of a concession and its period are entirely matters of negotiation between the applicant and the authorities; also the matter of renewals and the methods to be adopted in operation. In these affairs the surface owner has no voice, nor can he make any claims for rental or royalty.

Forfeiture of grants may be declared by the authorities whenever rentals or royalties are not promptly paid, if the orders of the Department of Mines concerning methods of operation are not satisfactorily executed, or if production is restricted to an extent prejudicial to the public welfare. A forfeited property cannot be granted again to the same concessionaire.

Soil owners who wish to operate placer deposits or quarries upon their own ground, or who desire to give such privileges to others, must take out government licenses, and all operations must then be conducted under the general surveillance of the

[1] The franc is worth 19.3 cents in U. S. gold. It is divided into 100 centimes. Hence, 5 centimes are nearly the equivalent of one cent.

Department of Mines, and under the general laws relating to the safety of workmen and to sanitation.

GERMANY

There are two mining laws in force in the German Empire, one of which governs the industry in the kingdom of Prussia, and the other in the kingdom of Saxony.

The Prussian Law

(Law of June 24th, 1865, as amended July 1st, 1905, and June 18th, 1907)

Prospecting is free for all under-soil mineral substances (which are held to be exclusive State property), with the exception that in two of the small States the local governments have reserved to themselves the right to search for and mine coal beds and deposits of certain salts. But in both these cases the right exists to delegate these privileges to others.

If a surface owner refuses to allow prospecting on his property, the explorer, on applying to the authorities, can secure the desired right upon an area and for a term agreed upon between them and himself, the sole consideration being the execution of a bond in such an amount as, in the opinion of the government, will secure the owner of the surface suitable compensation for damage that may result from the operations.

When a new ore vein or body is discovered by such an explorer, within the prospecting area granted to him, he can obtain mining privileges on the same by written application made to the authorities within a week of the date of discovery. In case of failure to do this, the franchise will be given to the first applicant thereafter who is able to prove that the discovery is a new one, that it was legitimately effected, and that it is of sufficient importance to warrant the expectation that it can be made a profitable or at least a self-sustaining business venture.

Surface owners cannot claim any interest in mineral values recovered from under the surface soil of their property, and must allow to the mining operator such use of the surface as may be

reasonably necessary. On his part the miner must pay a proper rental, or purchase the ground outright at a fair valuation.

However, the law gives to the authorities the right to refuse arbitrarily an application for prospecting or mining rights, or both, whenever in their opinion it would be injurious to the public order, health, or safety to grant them.

The Saxon Law

(Law of August 31st, 1910)

The State claims exclusive ownership of all ores of the metals except bog iron, of deposits of salt and its associated minerals, of salt springs, and of all radio-active substances. The right of searching for and of obtaining mining privileges on deposits of the first class (the metals) is free to all. The State reserves the right to explore for and work the others, and is empowered to delegate this right to individuals and corporations. Coal and other combustibles belong to owners of the soil, also quarries and any other mineral substances occurring in the surface soil or lying above or upon the bed rock.

Anyone who desires to inaugurate a search for metals on property owned by another may secure permission to do so by being the first applicant to the authorities for the privilege. The maximum size of tract that will be allowed for the purpose measures about 100 acres, and the term permitted is one year, with an extension of six months for good cause shown. Any number of such prospecting areas will be allotted to an applicant, so long as each one is separated from any of the others by a distance of not less than about 6000 feet. Before application is made to the authorities for the permit—which costs only a nominal sum—it is customary to ask the surface owner for the right. If it is refused, the authorities will authorize the work and its continuance to the extent that they may deem advisable, so long as it promises to bring about some useful result. The soil owner can claim indemnity for any damage that may take place. If ore is found and the discoverer thereof applies to the authorities within the term of

his permit, he will be given a working license. If he fails to make the application the franchise will be given to the first applicant thereafter who is able to demonstrate the existence of the ore to the authorities. The concession is not a perpetual one, but is continued from year to year as long as the Department of Mines remains satisfied with the operations of the concessionaire. No royalties are claimed by the government on the products recovered, nor rental for the surface occupied. The soil owner, however, can exact a fair compensation for the acreage used.

GREAT BRITAIN

In the British Isles the owner of the surface is legally also the owner of all substances vertically under it indefinitely, except as to gold and silver, which are nominally the property of the Crown, though this right is no longer insisted upon. All other metals and minerals may be sold, leased, or otherwise conveyed at the will of the owner by the ordinary documents of conveyance. There is therefore no mining law in the meaning of the term elsewhere, and the State has nothing to do with the mining industry except in the matter of settling controversies between owners, or in providing for such easements as are necessary for rights of way for railroads, vehicle roads, and canals. Mines are subjected only to the usual land and income taxes, even in the case of the few and unimportant gold and silver producers that have, in recent years, been discovered and operated.

No legislation whatever relating to the industry occurred until the year 1850, and this had to do only with the contractual relations between owners and leasers of mines, providing measures of arbitration in case of disputes. Subsequently, in 1872, 1887, and 1911 laws of a police and sanitary nature were enacted.

The tin mines of Cornwall and Devonshire, the coal and iron mines of Gloucestershire, and the lead mines of Derbyshire are operated today under very ancient customs, not very different from those that were in force in Germany and other parts of the continent during the twelfth and thirteenth centuries. In Corn-

wall and Devon an institution called the Stannary Court,[1] the origin of which is lost in antiquity, exercised a limited degree of control between surface owners and lessees, the principal effect of which is to compel the former either to work the mines themselves, or to allow others to do so upon the payment of a reasonable rent or royalty. In Derbyshire there still exists a somewhat similar organization, by the acts and decisions of which the very ancient right of following the veins of the region on their dip outside of surface side lines, in accordance with the principles in force in central Europe during and before the fifteenth and sixteenth centuries, has been preserved to the locality.

ITALY

There are four varieties of mining legislation in effect in this kingdom. Although in fundamentals they are much alike, yet the differences are such as to make it necessary to consider each law by itself.

(Law of August 9th, 1808, governing the industry in the states of Modena and Reggio)

Anyone may carry on prospecting work at any one place and on any unused land, regardless of its ownership, for a continuous period not to exceed six months, at the end of which term if it is desired to continue exploration a defined area must be applied for. This will be allowed by the authorities if, after formal investigation, it seems to them advisable to do so. In deciding this point, if the application is for a new ore body in a mine at one time worked and then abandoned, the right to reopen and operate is first offered to the soil owner, who has three months in which to consider the proposition. If he fails to accept, the property is turned over to the applicant who has been prospecting it. If he accepts, he is under legal obligations to compensate the discoverer in a manner and to an extent satisfactory to the authorities. If the application is for an entirely new ore occurrence the grant will

[1] Abolished 1896 and jurisdiction given to County Courts.

be issued to the first discoverer of it, if he is able to satisfy the authorities that he can command the means to open and operate it properly. If he cannot, it goes to the next applicant, who must indemnify the discoverer to a reasonable extent (in the opinion of the authorities) for the expenses incurred and for the fact of the discovery.

The maximum term of a mining grant is 50 years. Its area and conditions are matters of negotiation between the applicant and the government. The papers evidencing the concession must state the substances that are expected to be recovered, and all matters of rental to the soil owner or royalty to the State are based upon these statements. If other desirable substances are found and recovered, the concessionaire has a preferential right to them if he accepts the terms which the authorities set in consideration of the additional grant.

(Law of November 20th, 1859, governing the industry in the States of Piedmont, Sardinia, and Lombardy)

No prospecting for mineral substances is allowable, even by a surface owner on his own ground, without written governmental permit. But such a document, covering exclusive prospecting rights on a defined area (size and conditions of same being matters of negotiation), will be granted to the first applicant whose ability to conduct operations is satisfactory to the authorities. If the explorations result in the discovery of a new ore body or occurrence, the Minister of Public Works makes announcement of the fact by advertisement, which has the effect of giving to the discoverer the preferential right to claim a mining grant of the premises if the claim is made within six months of the date of the advertisement. In case of failure to do so the government is empowered to confer the grant on the first applicant thereafter who will accept it under the conditions of paying a proper consideration to the discoverer. The amount of this payment is arranged between the parties in interest if possible, otherwise it is determined by the Department of Mines. Whoever obtains the grant must first satisfy the authorities that he can command the

capital to develop and operate properly, and in accordance with good mining practice.

This law is also known as the Royal Mining Law, and applies in all parts of Italy wherever there is no State law, as well as in Piedmont, Sardinia, and Lombardy.

(Law of May 3rd, 1847, governing the industry only in Lucca)

This law is in all essentials similar to that of Piedmont, Sardinia, and Lombardy, except that if the actual discoverer cannot qualify to the satisfaction of the authorities, then the owner of the surface has the next right to claim the premises. In the event of his failure to do so, or to qualify, the right passes to the first outside applicant who can comply with the conditions established by the authorities, which includes proper compensation to the discoverer.

(Law of June 21st, 1852, governing the industry only in Parma)

In this state the quarries as well as the underground mines are held to be the property of the Nation. No license is required to prospect, but only a very limited amount of exploratory work is allowed without special permission from the government, and when a discovery is made the authorities must be advised of the fact within 15 days. The locality is then subjected to inspection by experts, whose report determines whether the property shall be taken over for operation by the State or be conceded to others. In the first case the discoverer is indemnified for his work, and suitably rewarded for his discovery. Under the other decision the mining right will be awarded to the discoverer, if he can qualify to the satisfaction of the authorities; if not, it is next offered to the surface owner. If he declines, or is unable to qualify, the government passes it to the first satisfactory applicant. Whoever secures the grant must care properly for the interests of the discoverer. The grant when given is for an agreed area and time, and is renewable according to its terms, but cannot be made perpetual. It conveys the right to recover and realize upon all mineral substances found

vertically under its surface area. No rental can be collected from the grantee by the soil owner.

THE TWO SICILIES

In these States the surface owner is also the exclusive proprietor of the undersoil. He may explore for and work mines on his own ground without any obligation to the government. In case a mineral discovery is made on his premises by anyone else, he may take advantage of it himself after giving reasonable compensation and reward to the discoverer. If he does not do so within a given time after notification from the latter the State has the right to offer the property in one or more tracts, first to the discoverer, and next to the general public. In each case the recipient must pay to the soil owner an annual rental to be determined by the government. If the discoverer is not able to qualify financially, the opportunity passes to the first applicant who can satisfy the conditions set by the authorities, which include a set compensation to the discoverer. This may, at the option of the latter, take the form of a lump sum, or of an annual payment for a set term, or of a percentage of the gross or net profits of operation. The term and size of the grant and all other details are matters of negotiation between the authorities and the concessionaire.

NORWAY

(Law of July 14th, 1842, with amendments to date of January 1st, 1918)

The State claims the exclusive ownership and control of minerals of all kinds occurring on or in government land, and of all found underneath the surface soil in rock in place on privately owned property. But metalliferous alluvial (placer deposits), and all other minerals found above the bed rock and in the surface soil of alienated land belong to the owner of the surface.

Prospecting is not free. A permit is obtainable at any time without cost, good for one year, on application at the office of the local authority, but applies only in the district under the control of that officer. It permits search by excavation on public

or private land except in the public roads, parks or other like reservations. Explosives may be employed, but special regulations are prescribed for their use within 400 feet of a building. When the operations are to be carried on upon alienated land an additional permit must be obtained from the authorities, to be presented to the owner, and security given to the satisfaction of the local chief official for all damages that may result. All excavations must be fenced, and if abandoned must either be filled up or surrounded by a substantial stone wall.

To secure prior rights to a discovery the discoverer must give written notice in duplicate to the authorities within 18 months from date of discovery, and furnish sample of the mineral found. The surface owner has a right to claim a one-tenth interest in the adventure, and can demand that 10% of all material raised be left on the premises until an agreement has been made with him. But this agreement must be consummated and recorded within six months after production begins. If not, the surface owner has the right within the following three months to dispose of his 10% interest at public auction if he can.

The size of claim for well defined lodes or veins is 900 feet in length by 42 feet in width; for all other kinds of deposits, a tract 1500 feet square. No royalties or ground rent are demanded by the government, or allowed to be claimed by the surface owner. If the claim is located on government land full surface rights go with the underground franchise. If on private land the miner can claim such surface area as he may reasonably need for economical operation, but must buy or lease it from the surface owner on terms set by the authorities. Before any ore can be removed and realized upon, the claim must be surveyed by a government engineer at the expense of the claimant, monumented at the places indicated by the engineer, and registered.

PORTUGAL

(Law of February 26th, 1892, with amendments to January 1st, 1917)

The State claims the exclusive ownership of all deposits of ores (in rock in place) of the metals, combustibles, and asphalts

(except peat), salines, graphite, and phosphates, wherever occurring within its borders, and will grant rights to work the same under the provisions of the law. Also it claims the sole property of all mineral springs, but the privilege of utilizing them may be obtained under a special law. Placer deposits of all kinds occurring on the public domain, so long as they exist in the surface soil only, may be operated by anyone, without the necessity of applying for a government permit or concession, if the methods of operation are of a primitive nature. But if it is desired to install dredging or hydraulic plants or any other mechanical devices, a permit must be applied for and a concession secured. Bog iron ore may also be freely worked by anyone, but if the ore is to be reduced to metal a concession is necessary. Quarries and placer deposits on alienated land belong to the surface owner, and may be worked by him or with his permission without concession.

Materials of general public use and need like brick and pottery clay, when on alienated land, if not operated by the soil owner or with his consent, may be commandeered by the government and offered publicly for concession. Peat belongs to the soil owner, but can be worked by him only by virtue of a government license. No metallurgical works of any kind may be installed without government knowledge and permission.

Prospecting is free to natives and aliens on both the public domain and privately owned land, so long as it consists merely of surface inspection and the digging of shallow pits. When a discovery is made the discoverer must at once notify the chief authority of the district in which it lies, giving him a sample of the ore found, together with a full and accurate description of its situation, and the name and address of the surface owner, if any. If on examination by government mining engineers the statements are in the main verified, the applicant is given a permit granting exclusive prospecting rights on a tract of land in the shape of a circle with the place of discovery at its center. In the case of metals and phosphates the radius of this circle is 560 meters, and for all other substances 707 meters. This permit

is transferable by endorsement and acknowledgment of the signature before a notary. It is good for 12 months and is not renewable. It confers the right to explore to the depth of 20 meters by a shaft, or 40 meters by a drill hole, and by drift or levels up to 25 meters of length, or by surface trenches not over five meters deep. But the holder is not allowed to remove or sell any ore found. During its term he must apply for a defined area within his circle or forfeit his discovery right. No excavating is allowed within 30 meters of a building, railway, public road, canal, or public fountain, nor within 1400 meters of fortifications, nor under orchards, gardens, or irrigated lands. But it is allowed on other cultivated lands when proper security is given for possible damages.

The preliminary exploration work having been accomplished, and the results proving satisfactory to the explorer, he applies to the authorities for a document called a "discovery right," accompanying the application with a deposit of 130,000 reis[1] to cover the costs of title investigation, survey, advertising, etc., all of which are done under the supervision of the government. The minimum area allowable for a claim is 10 hectares, and the maximum 50 hectares in the case of a metal or phosphates, and 100 hectares for all other substances. In shape the claim may be a circle, a square, or a rectangle, at the option of the claimant, and under certain conditions a polygon. The place of discovery must be at its center, or as nearly so as possible. Publication during 70 days in the Official Gazette and posting during eight days in the office of the chief of the district follows, and during this period all objections to the claim must be filed. If the proceedings are completed without the presentation of any adverses, or when such as may be presented are successfully controverted in open court, the applicant is given a "Certificate of Discovery," upon which the authorities set a price, based not only upon the work done by the discoverer, but upon the

[1] Approximately 2000 Portuguese reis are the equivalent of $1.00 U. S. gold. Hence 130,000 reis correspond to $65; 40,000 to $20; 500 to 25 cents and 300 to 15 cents.

importance of the discovery in the opinion of the government engineers.

At any time during the following six months it is the right of the holder of such a document to apply to the authorities for a concession, which must be granted to him if he can comply with the conditions required in such grants. These, in the main, are to prove the ability to guarantee to the government that the property shall be developed and operated with ample capital and skill. If the discoverer or his assigns cannot do this the claim is offered to the general public, and disposed of to that bidder who makes the most satisfactory tender for it. This party, in taking possession, is required to pay to the holder of the discovery certificate the price set by the government, in cash, or to liquidate the claim in some other way.

The concession, when granted, is perpetual, so long as the concessionaire pays the direct and proportional taxes promptly, and faithfully observes all the other conditions specified in it. These include indemnity to the surface owner (if it is on private land) for all damages resulting from operations, and keeping on deposit with the government the sum of 40,000 reis as security for any future injury. Active work must begin within three months of the date of the concession, and thereafter be continuous to an extent satisfactory to the authorities. A concession conveys the right to operate only for that kind or class of substance that has been specifically described in the "certificate of discovery" upon which it is based, together with such others as may be so intimately combined with it as to render their simultaneous extraction an economic necessity. No laborers under 14 years of age may be employed in underground work.

A concession cannot be sold, either in whole or in part, without the written consent of the Department of Mines.

Government taxes are as follows: a fixed tax of 500 reis per hectare per annum for metals and phosphates, and 300 reis for all other substances; a proportional tax of 2% of the gross value of the product at the mine, excepting in the case of pyrite and man-

ganese oxide, when the tax is 2½%. But iron ore, if reduced to the metal in the country, is free from this tax.

Concessionaires can claim the exclusive usage of any part or the whole of the surface within the lines of their concession, but must pay to the surface owner (if any) a rental for the area used, and a royalty equal to one-third of the proportional tax levied by the government on the output. The amount of the rental is arranged amicably if possible between the interested parties, but if that proves to be impossible the authorities will set its amount. The concession, as delimited on the surface by monuments set by the government engineer, is bounded under the surface by vertical planes passing through the surface lines, no extralateral rights of any kind being allowed.

RUSSIA

In this great country, excepting in Finland and Russian Poland, the fundamental principle of the mining law is the doctrine that the owner of the surface is also the owner of all substances vertically under it. But the State, which is a very large owner of land, offers the enjoyment of underground mining privileges to all who apply for it, and on generally favorable terms. In Finland the mining regulations are very similar in detail to those of Sweden, and in Russian Poland to those of the kingdom of Prussia.

In the balance of Russia (including Siberia) surface owners may freely explore for minerals on their own land, under no obligations to the government other than that of giving notice of the discovery of new ore bodies and occurrences, if they are of importance enough to warrant development. With the same obligations, owners can sell or lease their underground rights.

On State lands no license is required by one who simply inspects the surface for indications of mineral and does no digging, excepting in the case of those who are exploring for gold and amber, where a permit is strictly required. Its cost is nominal, but it is given only to individuals who are certified to the authorities as reliable. In all other cases, as soon as the prospector desires

to inaugurate development work of any serious extent, and wishes exclusive right at the place selected, he may obtain the same by application to the authorities for a definite area and for a definite time. These are usually granted, and under reasonably fair conditions, and the franchise is assignable.

The holder or assignee of such a prospecting tract has the exclusive right, during its term, to demand from the government a concession for such part—or all— of it, as he may desire. When received, it takes the form of a perpetual grant, depending for its maintenance on reasonably continuous and energetic exploration work, in default of which the State may at any time resume possession. It carries the right to the use of the surface for all legitimate mining purposes, except for the establishment of works of all kind for the treatment of the ore. When space for such installation is needed it must be purchased, and on such tracts only surface rights are given.

SPAIN

(Law of July 6th, 1859, with amendments to date of January 1st, 1917)

For the purposes of the law all mineral substances are divided into three classes, as follows:

Class 1.—Brick clay, slate, grindstones, basalt, limestone, gypsum, sand, marl, and in general, all substances that are quarried. These, when on public land, are open to appropriation by anyone, but when on privately owned land belong to the soil owner, and may not be taken from him. But, when such deposits are worked by the soil owner, they must be operated in accordance with the provisions and regulations of the law as regards the safety of employees and matters of sanitation.

Class 2.—Metalliferous alluvials, bog iron, emery, ochres, abandoned mine and slag dumps, peat, pyrites, alum, magnesite, fuller's earth, phosphates, baryta, fluorspar, soapstone, kaolin, asbestos, pumice and potter's clay. These, when on the public domain, are open to appropriation, but when on alienated land are obtainable only through the permission of the Governor of the Province in which they lie. In the case of potter's clay, if

the owner refuses to produce it, the Government reserves the right to expropriate and lease the deposit.

Class 3.—Metalliferous deposits of all kinds existing in rock in place. Also coal, asphalt, petroleum and natural gas, graphite, salines, copperas, sulphur, and precious stones. These belong to the Nation and cannot be sold, but are open to appropriation under lease by anyone, whether situated on the public domain or upon alienated land.

When any doubt exists as to the class to which a mineral substance should belong, the question is decided by the Governor of the Province under the advice of the Bureau of Mines.

Prospecting is free except within 40 meters of public buildings, highways, bridges, ditches, fountains and reservoirs, or within 20 meters of a public railroad, or 15 meters of a private railroad, or in the vicinity of public baths and mineral springs, or within 1400 meters of fortifications or other government military reserve.

Prospecting excavations may not exceed a length and width of two meters and a depth of one meter, and when they reveal nothing, and are to be abandoned by the digger thereof, they must be filled up.

Gravel deposits carrying gold, tinstone, precious stones, or other valuable minerals or metals, may be worked by anyone, without the formality of filing claims, so long as the operations are of a primitive nature, and are conducted by working individuals. The same applies to ochres, so long as the mineral is not smelted.

Prospectors may secure exclusive rights to test selected areas of reasonable size by deep shafts or boreholes, by special application to the government. The terms and conditions of such grants are wholly a matter of negotiation with the authorities. Before abandoning a grant of this kind the government must be notified of the intent at least five days before the act.

The following areas are not open to prospecting: the mercury district of Almaden, the copper district of Rio Tinto, the lead districts of Linares and Falset, the sulphur districts of Hellin and Benamaurel, the graphite district of Marbella, the iron

districts of Asturia and Nivarre, the vicinity of Trubia in the province of Oviedo, and all salt producing districts at present in operation.

The unit lode mining claim, which applies to all mineral deposits of that nature, is a rectangle measuring 300 by 200 meters, laid out on a horizontal plane and bounded in depth by vertical planes passing through its side lines. No extralateral rights are allowed. Such claims, except when located on the public domain, do not carry surface rights. But when located and approved on private land, the claimant acquires a natural preferential right to such parts of its surface as may be required for all proper mining operations, but must arrange with the surface owner for what is needed. Any number of these may be acquired by individuals or companies, but the former may apply for only two and the latter for only four in one formal application.

The unit claim for iron, coal, peat, asphalt, sulphur, rock salt, and all substances found in rock in place but not in veins, is 500 by 300 meters.

The unit alluvial claim, applicable to all mineral deposits in the surface soil and above the bed rock, is 200 by 300 meters, taken in any desired shape not smaller than a series of adjoining squares each of which measures 20 meters on the sides. In the case of this class of claims an individual may unite four and a company eight in one application.

A discovery of mineral is a necessary prerequisite to the filing of an application for a claim of any kind. No claim may be less than four hectares in area.

The procedure for acquiring mining property is practically the same for all classes of claims. A discovery having been made the discoverer decides upon the area he wishes, and plants provisional stakes or monuments, noting the position of each with respect to any landmark in the vicinity or any other occupied ground. Then, either personally or by a duly authorized agent, he makes application for the ground directly to the Governor of the Province in which it lies. The government provides blank forms for all classes of applications, and other necessary

documents connected therewith. These are printed upon stamped paper, the stamps being of various denominations, and the indicated value of those used by the applicant must be paid for by him. They call for detailed descriptions of the position, extent and surroundings of the area desired, all of which information the applicant must furnish. The blank having been filled out, it is signed by the applicant and witnessed, and is started upon its official journey through the government offices having such matters in charge. If the ground desired is on the public domain—of which naturally there is little left—a conclusion is reached within a month or two. But if it is on private land, as is generally the case, the journey takes from three to six months, according generally to the obstacles presented by the surface owner to the grant. Or, the latter may decide to work the ground himself, for which the law gives him a preferential right within a certain term.

A fee of 150 pesetas (about $45) must accompany each application, and an additional amount if there are several applications, and if their combined area is in excess of 20 claims of any one class. The total must be at least 5% of the first year's rental, the other 95% being due and payable when the grant is allowed.

While the application is under consideratior and being advertised, no work can be done upon the ground, and when it is granted it gives the right to work for one class of mineral only. If the application is allowed the ground must then be accurately surveyed and properly monumented by a government engineer, whose charges are moderate, and these landmarks must be kept in good repair by the claimant. If, during the course of operations, minerals are encountered other than the one for which mining privilege was asked in the application, the authorities must at once be advised of the incident so that the rate of royalty may be adjusted.

Statistical reports of operations must be furnished to government officials whenever called for.

Immediately upon the issuing of a mineral grant the document is registered, and the claimant is put in physical possession by

the local alcalde. Thereafter conveyancing rights are complete, except for reserved minerals.

Everyone engaged in mining must have a representative in the capital of the Province in which the property lies, unless he is himself a resident of the capital.

The annual rental on an ordinary quartz or alluvial claim is 30 crowns (about $15). For a coal claim it is 20 crowns; for slag heaps and old dumps it is 40 crowns per 40,000 square meters of surface in the claim; for prospecting claims, 10 crowns per claim of 60,000 square meters. No rental will be charged on iron claims until the year 1925.

The government reserves the right to establish drainage areas, and to compel all claimholders therein to contribute to the cost of drainage in proportion to the area of their ground. All mines must have at least two exits, and all shafts substantial ladder ways.

No fee simple title is given to any mineral land. The right of possession and usage, when an application is allowed, depends upon the payment of the annual rental and also upon the performance in good faith of at least 732 shifts of labor per unit claim per year, being the equivalent of four workmen for half the days of the year. In a group of claims all of this may be done at one or more points, at the option of the claimholder.

When it is desired to abandon a registered mining property 30 days' notice must be given to the authorities of the intent, and the claimant is held responsible until all debts are paid.

Individuals or companies buying claims must, within 20 days from date of transfer, send a certified copy of the document to the authorities, together with the prescribed transfer fee, which varies with the consideration and the nature of the property sold.

Export duties on metals or minerals may not be in excess of 3% ad valorem.

Tunnel rights for drainage, exploration, or working purposes are obtainable under reasonable conditions, with rights of way through claims along their line, and working rights on new veins discovered in driving them.

A royalty of 3% or less of the gross value of all minerals or metals produced and disposed of is payable by all producing mines. This tax is collected quarterly.

SWEDEN

(Law of May 16th, 1884)

The State claims the exclusive ownership of all undersoil substances, and allows free prospecting everywhere to the extent, however, only of surface inspection, and the taking of assay samples. If it is desired to make excavations, a circular area with a diameter of about 600 feet must be selected, and application made for a digging permit thereon, which will be granted to the first applicant. If more than one application is made simultaneously for the same area, the permit is given to the one who can prove that he was the first discoverer upon it. In default of this a collective or partnership permit is issued. Under either, the holder must begin work in earnest and with suitable appliances within eight months, and maintain continuous and energetic labor thereafter during the balance of the term, which has a maximum length of three years. Before its expiration, if payable ore has been found and the concessionaire desires to continue possession, he must apply for a working permit, and may select from within his circular prospecting tract the largest possible rectangular tract that it will contain, and formally apply for working privileges thereon. All terms and conditions are matters of negotiation with the authorities.

In this franchise, when secured, the soil owner is allowed by the law to participate (in expenses and profits) to the maximum extent of 50%, if he desires to do so, and if he gives notice to that effect to the government before the working permit is issued.

TURKEY

(Law of May 13th, 1915, with amendments to January 1st, 1917)

For the purposes of the law all mineral substances are classified as follows:

Class 1.—Those found underground in rock, in veins, lodes, beds or masses, or as replacements, segregations, etc.

Class 2.—Those found above the bed rock in the surface soil, as all alluvial deposits and many earthy substances.

Class 3.—Mineral springs.

Class 4.—Quarries, which may be operated in the open.

The government claims the exclusive ownership of mineral substances of all kinds, whether existing on the public domain or upon alienated land. The government will not sell its mineral rights, but will grant long term leases called "concessions," in return for an annual occupation tax on area conceded, and a percentage of the net profits. There are no such things as mining claims. When a tract of land is desired for mining purposes application must be made direct to the central government through the Minister of Mines, with whom the concession is arranged on such terms as seem to him advisable. The bargain thus struck, when ratified by the Sultan, or when left with him for consideration and not adversely acted upon within six months, becomes legally valid.

Any land owner may freely prospect on his own land without license or other formality, but may not extract ore or realize on the same without first applying for and obtaining a concession.

No prospecting is allowed on the public domain, nor on alienated land—except by the owner thereof—without a license. In addition, the holder of a license must obtain the consent of the owner before he can prospect on alienated land. If the owner is unreasonable in his demands appeal may be taken to the authorities, who will arrange for equitable terms.

Application for a prospecting license must be made to the Governor General of the Province in which the land lies which it is desired to prospect, who will immediately allot to the applicant, provisionally, an exclusive area not to exceed 4000 hectares in area, upon which he can go to work at once if he chooses; but the authorities require six months in which to consider the proposition, and reserve the right to reject it within that term. If granted, the applicant must begin work in earnest within three

months from date of issue. The fee is 10 shillings, plus all the costs connected with the six months of investigation, which are heavy. The term of the permit is two years, with the right of an extension for an additional year, for good cause. During this period the holder has the right to mine and sell ore, after paying the appraised royalties on the same, and also may sell or mortgage his franchise. Samples of all valuable minerals found must be sent at once to the local authorities.

Within the term of the license (or that of its extension) a concession must be applied for, if one is desired. To secure it application is made direct to the Minister of Mines. The applicant must give complete information about his prospect, accompanied by maps, samples of ore, etc., and must state the particular kind of ore it is expected to produce, and furnish the Minister with satisfactory evidence that the mine can be worked profitably, and that he can command sufficient capital for proper equipment, etc. The documents so compiled go first to the government engineer for examination and verification. A lump sum of money—as estimated by the Minister of Mines—to cover his travelling expenses and time must be deposited in advance. If the report of the Engineer is unfavorable the concession is refused. If favorable, publication of the application both locally and in the Government Gazette at the capital follows. If no objections are filed during that period the papers finally go to the Sultan, who approves or disapproves as he sees fit, or neglects altogether. The law allows a period of six months for his action. If within that term he does not disapprove then the Minister of Mines must execute a grant in favor of the applicant.

The term allowed is anywhere from 40 to 99 years, and the final fee ranges from £50 to £200, according to the estimated importance of the concession. The rental is £1 per hectare per annum, payable in advance, and due thereafter on or before March 1st of each year. In addition, a royalty on the net profits is demanded, payable as soon as the product is converted into money. This may range in amount to from 3% to 20%, according to the nature and value of the mineral.

Concessionaires must begin work within one year from the date of issue of the grant, and thereafter must continue work with reasonable diligence. All employees must be Ottoman subjects except the Engineer, the technical staff, and Superintendents. Full and complete records of all kinds must be kept, and also maps, and the same at all reasonable times held open for inspection by local and general government officials of the Bureau of Mines or their deputies. If new ores are found other than those mentioned in the concession, the government reserves the right to insist upon a new grant, or the formal amendment of the existing one.

Ancient mines, abandoned and forfeited mines and mines that have been rejected by the government engineers as probably unpayable are put up at auction every six to twelve months, and granted to the highest bidder.

When a concession is secured on alienated land, the holder thereof must arrange with the surface owner for such rights of the surface as may properly be needed for its economical operation. If a rental deal is made the owner may collect double the net revenue the gound has been yielding to him. If a sale is made the owner may collect double its assessed valuation.

Mines cannot legally be abandoned within five years from date of concession. Or, if abandoned sooner, the liability for rental continues to the end of that term. To effect legal abandonment the concessionaire must formally apply to the Ministry of Mines, accompanying his application with full reports on the history, production and present condition of the property, with both surface and underground maps in triplicate, and list of all improvements and installations.

A prospector who has discovered a mine, but who has been refused a concession for the same, has the right to collect from anyone who subsequently secures a concession for it a lump sum of £100 and 5% in perpetuity of the net profits that may be realized.

If a third party, prospecting on a conceded tract, makes a discovery of a mineral the right to work which is not mentioned

in the concession, the discoverer has the preference—other considerations being equal—in obtaining a concession himself to work the newly found mine.

Concessionaires on the public domain must delimit the surface area they desire to use in connection with their underground operations, and may not exceed that area without formal authority duly obtained. On the thus selected and monumented part of the conceded tract prospecting by others is prohibited, while on the remainder all duly licensed prospectors have full rights.

SERBIA

(Law of June 27th, 1900)

The State claims the exclusive ownership of all underground property. Prospecting, if any digging is contemplated, is not permitted, even by a soil owner on his own property, without governmental authority. This however may be obtained by anyone and without cost. The document simply gives the right of surface inspection, and of making such small excavations here and there as may be necessary in the process of taking hand samples. If, however, the explorer wishes to do more work at any particular place, he may secure at a nominal cost an exclusive right, good for one year, to explore a defined tract not to exceed in size about 125 acres. This right is renewable at the discretion of the authorities.

If a permanent mining right is desired, a rectangular area measuring about 1500 by 600 feet will be granted whenever the explorer satisfies the authorities that he has discovered a new ore body or occurrence that can be made profitable, that he is personally qualified by knowledge or experience to bring about such a result, and that he can command sufficient capital. The grant, when allowed, is for 15 years, at the end of which time it is renewable at the discretion of the authorities, and may be made perpetual. But even in the latter event a sale of the property is not legal without the consent of the authorities.

RESULTS

It has not been found possible to collect accurate statistics of the metal production of Europe prior to 1900. This is due to the fact that a very considerable amount of the ore treated in European smelteries comes from other parts of the world, and, until recent years very incomplete records were kept or given out of these importations. Again, since the outbreak of the war no statistics are available from Germany, Austria-Hungary, the Balkan states and Turkey, and little that is reliable from Russia. Hence the following tabulation, which covers only the thirteen year period from 1901 to 1913 inclusive. And in presenting it the author desires to admit frankly that it may be in part somewhat inaccurate because, in spite of the great care taken, he believes that in the items of copper, lead and zinc some metal has been included that originated in South America, Australasia and South Africa. It must therefore be taken for what it may be worth. It is thought that the possible errors will not exceed ten to fifteen percent at the utmost.

Nearly all of the gold and all of the platinum is produced in Russia, nearly all of the tin in England, and all of the quicksilver in Spain, Austria and Italy.

As the figures show the gains to be greater than the losses the industry as a whole is in an advancing condition, though the figures for platinum are somewhat misleading, for it is well known that the alluvial fields where this metal is found are approaching exhaustion, and are not being extended. But the decline in the output of the precious metals is not a healthy sign. In all mining countries the search for gold and silver has always been the main cause of the discovery of deposits of the other metals. The base metals have attracted the attention of the prospector either while looking for the noble ones, or after learning by experience that the latter are often present to some extent in ores of the former. Whenever the production of the precious metals begins to decline the inference is that few new discoveries of any kind are being made, and that the industry is living mainly

on its past record. This is preëminently the case in Europe where little if any public land remains outside of the old domain of the Turkish and Russian empires, and where the restrictions inevitably connected with searching over privately owned land in long settled communities discourage prospecting and limit the business of discovery to enterprises calling for large capital expenditures, such as the sinking of deep shafts or bore holes, or the installation of dredges or hydraulic plants.

The maximum gold product within the term was $41,866,904 in 1910, of silver $15,536,699 in 1912, of copper $44,755,990 in 1913, of lead $57,138,312 in 1912, of zinc $100,264,507 in 1912, of tin $4,573,800 in 1911, of mercury $4,485,705 in 1911 and of platinum $13,650,000 in 1912.

Europe, 1901 to 1913 (inclusive): Austria-Hungary, Belgium, France, Germany, Great Britain, Greece, Italy, Norway, Portugal, Russia, Spain, Sweden and Turkey.

Metal	Term	Years in term	Total product of term	Average annual product during term	Product of 1913	Gain (+) or loss (−) in 1913, as compared with average
Gold.....	1901 to 1913	13	$436,312,656	$33,562,512	$30,638,906	− 8%
Silver.....	1901 to 1913	13	163,150,915	12,550,070	10,853,269	−14%
Copper....	1901 to 1913	13	428,180,305	32,936,946	44,755,990	+36%
Lead.....	1901 to 1913	13	606,179,555	46,629,196	50,386,970	+ 8%
Zinc.....	1901 to 1913	13	814,690,603	62,668,508	83,529,600	+33%
Tin.....	1901 to 1913	13	45,199,024	3,476,848	4,323,002	+24%
Mercury...	1901 to 1913	13	44,186,997	3,398,999	4,112,080	+21%
Platinum..	1901 to 1913	13	101,645,024	7,818,848	12,375,000	+58%
			$2,639,545,079	$203,041,927	$240,974,817	+19%

CHAPTER XII

Miscellaneous Mining Laws. Digests of the Mining Laws of British Guiana, British India, Burma, Ceylon, China, Congo Free State, Cyprus, Dutch Guiana, Egypt, Federated Malay States, French Guiana, Gold Coast and Ashanti, Haiti, Japan, Mysore, Nigeria, Siam and British North Borneo

BRITISH GUIANA

(Law of 1903, with amendments to January 1st, 1917)

The government claims the exclusive ownership and control of all mineral substances occurring on the public domain, and of the precious metals and stones on alienated land. On the latter the owners thereof may prospect for, mine, and realize upon all other mineral substances within their lines without government permit, but are required to conduct their operation, so far as the treatment, safety, and health of employees are concerned, in accordance with the prescriptions of the law; also to be ready at all reasonable times, by keeping proper books of account and maps, to be able to respond to requests of government officials for statistical information as to their operations.

Prospecting is not free. A license is required, which may be obtained either at the office of the Commissioner of Lands and Mines at Georgetown, the capital, or from any district Warden. The cost is 25 cents. It is good for 12 months, and is indefinitely renewable—at the option of the authorities—at the same price. It confers the right to prospect for all mineral substances on the public domain, and for gold, silver and precious stones on private

land, and to locate as many claims as desired on discoveries of the same, but confers no right to mine, remove, or realize upon valuable material found.

When a discovery of importance is made the discoverer must, within 90 days, register his find with the district Warden, or, if there be none, with the Commissioner of Lands and Mines at the capital, and simultaneously to apply for a mining license. Registration fee is fifty cents, license fee, $2.00. The latter continues in force indefinitely so long as the annual ground rental and royalty are paid, and the property is operated to the satisfaction of the Warden in accordance with the provisions of the law and the regulations thereunder.

The rental required is 20 cents per acre per annum, payable in advance. The royalty is a matter of bargain with the authorities at the time the mining license is issued.

The maximum size for lode claims is 1500 by 800 feet; for alluvial claims not less than 1500 by 800 feet, nor more than 500 acres. When possible all such tracts must be laid out in the shape of parallelograms, and preferably as rectangles. Vertical planes form boundaries in all cases, and hence no extralateral rights are allowed. On precious stone claims, in addition to rental and royalty, a charge of four cents per cubic yard of gravel or soil handled is periodically payable, also a fee of $100 per acre—or fraction thereof—the latter in advance.

After registration of the mining license, conveyancing rights are complete, but must be effected through the government office.

The Commissioner of Lands and Mines has the power to issue licenses giving exclusive prospecting and mining rights on privately owned land for gold, silver, and precious stones, but not for any other metals or substances. The soil owner, however, may operate without license for the latter, but not for the former.

The government may at any time proclaim a mining district for all mineral substances on the public domain, and for the precious metals and stones on alienated land, and appoint a Warden in charge of it. As soon as the public are officially notified of the boundaries of such a proclaimed area, all entry therein or exit

therefrom is prohibited except at certain specified stations, and at these travelling parties of either natives or whites must stop and allow themselves to be searched and questioned.

The governor has the power to grant a concession for mining at any time. Its size, period, and terms are matters of negotiation except that the first item may not be more than 500 acres. Exclusive prospecting tracts may also be secured. In both cases the details of term, rental, royalty and other matters are arranged between the government and applicant.

BRITISH INDIA AND BURMA

(Law of September 15th, 1913, with amendments to January 1st, 1917)

Inspection of unoccupied government land and the taking of samples for assay or display from the surface are free. Upon occupied land the permission of the owner must be obtained. But no excavating or digging can be carried on without a prospecting license, and before this will be granted the applicant must show to the satisfaction of the authorities that he is a loyal subject of the British Empire.

The prospecting license is granted only in connection with a selected tract of land. To secure it application is made to the Collector of the district in which the tract lies, and a sketch map presented. Before the latter is prepared the tract may be marked off on the ground by suitable corner stakes or cairns of stone. A deposit of a sufficient amount to cover the cost of a survey is also required, and in addition a deposit of 100 rupees (about $32) per square mile—or fraction thereof—of the tract, or proper security must be given. The term allowed is one year, with an extension of two years at the option of the authorities. When the license is granted there is payable a fee not greater than one rupee per acre or fraction thereof per yearly term.

During the life of the license the holder has the exclusive right of exploration on the tract, and may realize upon substances found upon payment of the royalties as hereinafter given. An individual or company may take out as many of these as are

desired, and after registration the franchise may be sold or encumbered, provided the grantee is a party satisfactory to the authorities. The document of conveyance must, however, be registered and a transfer fee of 50 rupees paid. Within its term or that of its extensions the holder is entitled to demand a lease on any substances found except precious stones.

The maximum lease area is 10 square miles, which may be selected by the licensee in one or more blocks all of which must be wholly within the prospecting tract. But before the lease is granted the Collector has the right to demand of the applicant confidentially all information in his possession as to mineral found or geological formations and conditions encountered on those parts of the prospecting area not asked for.

A deposit of $160 (500 rupees) must accompany the application, also a sketch plan of the ground desired, a statement of the mineral or minerals it is expected to produce, and the period for which the lease is desired. If the map is not considered satisfactory by the authorities, they have the power to order one made by a government engineer at the applicant's expense, as a preliminary to which they can demand the delimiting of the area by the setting of stakes or cairns of stone at each corner.

In general leased areas must be rectangles with lengths not more than four times the widths. But the Governor in Council may authorize other shapes and dimensions, as for dredging areas, when, in his opinion, the circumstances warrant it. The term cannot exceed 30 years, but a renewal for an equal period is obtainable at the option of the authorities and on such new terms as they may set. A lease confers the right to mine for and recover only such substances as are expressly stated therein. If others are found a new lease must be taken out to cover them. The royalties demanded are as follows:

On coal and mica, 5% of the sale value at the pit's mouth with a minimum of four cents per ton.

On oil, 16 cents per 40 gallons. On iron, one cent per ton of crude ore.

On gold and silver, 7½% of the annual profits or 2½% on

the gross value of the ore treated or sold, at the option of the government. On all other minerals, 2½% of the sale value at the mine or after passing through dressing works.

There is also due under certain circumstances what is called a "dead rent," the amount of which is fixed at the discretion of the authorities, but may not be less than two cents per acre per annum for iron ore, eight cents per acre for coal, gypsum, bauxite and other industrial minerals and 32 cents per acre for gems, precious metals and base metals. This tax is levied only when the operations of the lessee are not satisfactory to the government, and when the royalty being paid is not as much as the tax would amount to.

For such surface area as the lessee may require, a rental of not less than eight cents and not more than 32 cents per acre is demanded, payable annually in advance. Leases are assignable provided the grantee is an individual or corporation satisfactory to the government, and under the condition that the intention to transfer and all particulars of the transaction be disclosed within one month of the date of the transfer, and the document of conveyance registered at the office of the Collector within a further period of two months. Registration fee is $16.00. Operations in earnest and with all reasonably proper appliances must be under way within one year of the date of the lease, and continued thereafter with diligence and skill. Complete accounts and working maps must be maintained, and the same, together with all parts of the property, both above and underground, held open for inspection and examination at all reasonable hours by the authorities.

Leases on areas yielding gem stones may be secured only through negotiations with the Governor General in Council. No lease of any kind may be abandoned without first giving the authorities 12 months' notice of the intention.

CEYLON

The government claims the exclusive ownership of all minerals, both in the surface soil and below it in the bed rock on the public

or Crown lands, but admits that surface ownership carries with it all underground rights except where the latter have been expressly reserved in the deed of grant. As Ceylon was well settled before it passed into the status of a Crown colony of the British Empire, the public domain is not large, and is confined mainly to the mountainous and difficultly accessible parts of the island.

Prospecting and mining for the precious metals and gem stones is forbidden, except to holders of government licenses. It is not clear whether these must be obtained by searchers for other minerals, but the presumption is that they should be. A license costs five rupees, is good for one year and may be renewed for two more at the option of the government; and it confers the right to search for and recover those substances specified in it when found on a selected tract, the name of the owner of which—if any—must be given, and his consent in writing presented when the license is applied for. The maximum ground rent claimed by the government from the holder of a prospecting license is one rupee[1] per acre per annum, and the maximum royalty is 15% on precious metals and stones, 10% on plumbago and 20% on all other minerals. In practice these rates are often reduced temporarily, and the amount of each substance that may be taken away and sold is fixed, the intent being to encourage the licensee, after a reasonable time devoted to exploring, to apply for a lease. Licenses are not transferable, and the holder of one may at any time during its life be called upon to respond to claims for damages by the surface owner for injuries inflicted or usage interfered with, or to give security for what may occur in the future as the result of his operations. At the termination of the license period or its extensions, the licensee must fill up or fence all excavations to the satisfaction of the authorities. At any time during its life the holder has the preferential right to apply for a lease if the tract is on the public domain, excepting for ground yielding precious stones, where the government

[1] The rupee is worth about 32 cents in U. S. money.

reserves the right to reject any and all applications, or to grant the ground to whom it choses.

Applications for leases are made to the local Agent of the central government in whose department the land desired is situated, and must be accompanied by a deposit (not to exceed 1000 rupees) to cover costs of investigation of title, surveys, etc. They are granted only on public or Crown land. Each application must state the mineral or minerals expected to be recovered, and must be accompanied by a map of the tract giving its situation with respect to well known land marks in the vicinity. The area asked for cannot be less than 10 acres, nor more than 100. No individual or corporation may become the holder of, or an interested party in leases to an extent exceeding a total of 500 acres. The ground asked for must be of rectangular shape, with length not greater than four times its width.

The term of lease cannot exceed 30 years and no agreement for its renewal or extension is permitted without special authority from the governor of the colony. A rental of 100 rupees per acre per annum is payable in advance. Royalties on sales are as follows: on plumbago selling at 300 rupees per ton of 2240 lbs., 10%; and on all of less value, 5%; on all other minerals not over 20%. But when the royalty exceeds the rental in amount the latter is remitted. All other conditions and terms are arranged by negotiation between the applicant and the authorities.

CHINA

Although China is now, and has been for centuries, a considerable producer of several of the metals—notably copper, tin, and antimony—it has no mining law. However, in those districts where most of the mines are situated, namely Yun-Nan, Se-Tchouan, Konei-Tcheou, and Kouang-Si, the industry is conducted under a code of customs of great antiquity, which—as would naturally be expected—are based on very primitive conceptions of human and property rights. There is of course no public domain remaining in the country. Every inch of the surface that will produce food for man or cattle is owned, and either

cultivated or used as pasture. The owners make no claim to underground rights of any kind, and no one attempts to explore for ore except the members of certain families and tribes who have held the right from time immemorial. For these, prospecting and mining are absolutely free. They may begin excavating at any time upon any piece of land, without permission of the owner or of the authorities, and without becoming to the least degree responsible to the former for any damage to his premises, or for any inconveniences in its usage. The one right possessed by a surface owner in connection with mining is the privilege of retaining 10% of the material brought to the daylight through a mine entrance situated on his land.

The male adult miners belonging to the mining caste operate either singly or in small or large mining groups as they may prefer, but generally in groups, and under the captaincy of a man who is not of their caste, but belongs to the lowest grade of the mercantile or trading class. He is never allowed to go underground or to direct mining operations. His function consists in acting as a business intermediary or agent for the miners in supplying them with food, clothing, tools, and other necessities, and in disposing of the ore produced. The latter is sometimes beneficiated in the vicinity, but more often exported to other regions for such treatment as may be necessary to make it marketable. He also cares for the food, shelter, and clothing requirements of the families of the miners while they are at work on the property in his care, and is absolutely responsible for the health, safety, and lives of the workmen. Finally, out of the proceeds of ore sales, he must manage to keep from the rapacity of the ore buyers, the governmental officials, and the tax collectors, his own small compensation or wage, if he can.

The miners, once underground and under cover, pursue the ore in any and all directions without regard to surface boundary lines, and are never molested or interfered with by those under whose property they delve, even when, as is sometimes the case, the foundations of houses and other structures are undermined, and loss or disaster results. Meantime they pay royalty only to the

individual who owns the tract upon which is the entrance to their workings. It often happens that after burrowing around through hundreds of feet of low drifts the miners will come to the surface for air at a point far distant from the opening where their operation began. The latter is then abandoned, and thereafter the royalty is paid to the owner of the tract upon which is the new entrance.

When two groups of miners working under separate captains encounter each other underground, the mineral in the face where they meet is divided between them, and each resumes operations in another direction. There is rarely any quarreling at such meetings.

The discoverer of a new mine or a new ore body in an old mine is held to be the sole owner of it, with the right to pursue it in any and all directions until he meets another discoverer advancing from some other starting point on the same vein or deposit. In each case a distinct and definite underground property right is considered to have been established, which is perpetual, and cannot be annuled by cessation of work or even abandonment of the premises for years. This right descends from father to son indefinitely. There are no government records of such matters, but the chain of title is preserved with great care in family archives. Naturally, after a system of this kind has been in existence for even a few generations in a mining region, if it is desired to secure a large area there for modern operative purposes, practically the whole population of the vicinity must be bought out or otherwise satisfied, before a title of any value can be secured, and even then there is no certainty that it will not be attacked sooner or later by descendants of families that have moved out of the region. So far the government appears to have made no efforts to alter this condition of affairs.

THE CONGO FREE STATE

There are two mining laws in force in this great region, one of which applies only in that part of it which is known as the Katanga mineral field, while the other governs operations over the

remainder of the territory in question. As is generally known, the administrative control of the valley of the Congo river was, in 1897, placed in the hands of Belgium. At that time little if anything was known of its mineral possibilities. What government existed was of decrees by King Leopold, under whose rule the exports consisted principally of rubber and ivory. When it became known that mineral indications existed in that part now known as the Katanga district, a code of mining laws was promptly promulgated to cover the assumed necessities of the case. This, known as the Congo code, is still in force in very much the same shape as originally framed. Later, when the very remarkable mineral resources of the Katanga field became better known, it was considered advisable by those in control to provide a special code for that region, which is known as the Katanga law, and which governs operations in a field that covers about 200,000 square miles.

The mineral production of the Congo basin is, as yet, merely nominal, because of the great distance of the mines from the coast, the enormous capital and long time required to establish lines of communication to them, and the fact that no workable deposits of coal have yet been found in Africa nearer than those in Southern Rhodesia. But it is now connected by rail with Capetown at the southern end of the continent, and with Beira on the east coast, and this has made possible the importation of machinery and supplies, and of coal from Rhodesia. Hence the southern and eastern edges of the Congo basin are now accessible and are slowly attracting a white population, which, however, so far consists almost entirely of Europeans connected with the companies that have been organized in England, France, and Belgium to operate the mines. There is practically no prospecting—in the American sense of the term—in progress in any part of the region, and really never has been, for the mineral deposits that have so far attracted the attention of capitalists there have been known of and worked by the natives for centuries for their contents in copper, and very few of the whites that have come into the country are of the class that would produce mineral explorers.

Nor is it at all likely that the mining codes in force would attract pioneers of that kind.

For the details of these two codes the author is indebted in the main to a very comprehensive article by M. Louis Aguillon, which appeared in the 11th Series of Annales des Mines, Volume 1, pages 5 to 28, of the year 1912.

The Congo Law

(Consisting of the royal decrees of June 8th, 1888, and March 20th, 1893, with amendments dated July 22nd, 1904, and October 18th, 1908)

The right to prospect for and work ores of the metals, coal, salines and other mineral substances can be exercised only by one who holds a permit to that effect from the authorities, the issue of which is discretionary with them, and in any event must be approved by the king of Belgium. Provided with such a permit a discoverer has a preferential right, during a term of six months after notifying the authorities of a discovery—if the latter has been made on land not already occupied by others—to claim a concession of a tract not in excess of about 250,000 acres in area, for a term of 99 years. If the application is allowed, a sum of about $500 must be at once deposited, together with an impost of about 80 cents per acre if the discovery is of the precious metals or stones, or about 40 cents per acre if of other substances, and work in earnest must be at once begun and maintained. In addition, a royalty is taken of 5% of the net profits of the business, unless it amounts to less than 40 cents per acre in the case of the precious metals and stones, and 10 cents per acre in the case of the other substances.

According to the terms of Section 2 of Article 15 of the colonial charter of October 18th, 1908, it was required that every application for prospecting or mining rights must be left for 30 days during its session on the desk of the two legislative chambers of the kingdom of Belgium for their consideration and approval, and must include a clause giving the government the right to repurchase the concession at any time for a reasonable consideration.

The Katanga Law

The Katanga district, though politically united in all other respects with the rest of the Congo Free State, has been granted a mining law of its own, the administration of which has been delegated to a Committee composed of six individuals, four of whom are appointed by the Belgian government and two by the Katanga Mines Company, and is known as the Katanga Special Committee, with headquarters at Elisabeth, the capital of the district. Also, the Katanga Mines Company appears to have been granted by the government of the Congo Free State the right to all the undersoil minerals of the country until March 11th, 1990, and is thus a chartered proprietary organization invested with the privilege of underletting these mineral rights and to administer the mining law during the life of its charter under the supervision of the Belgian government. Its standing is therefore very similar to that of the British South Africa Company which controls the region known as Southern Rhodesia.

The law is as follows: Mineral substances are divided into five categories, the first three of which depend respectively upon their contents in the metals, in sulphur or phosphorus, and in combustibles (coal, asphalts, etc.). The fourth includes rock salt, metallic salts, and mineral springs, and the fifth diamonds and other precious stones. All these are listed as substances the ownership of which does not pass from the State in grants of the surface for agricultural, grazing, and other lines of surface activity, but which remain the property of the government to be disposed of at its discretion under the provisions of the mining law.

The right to prospect is not free, but may be allowed through the purchase of what is called a "General License" which permits surface inspection throughout Katanga on lands not already under some form of mineral concession. It does not confer exclusive privileges anywhere. However, another document called a "Special License" is obtainable which does permit exclusive rights over a defined and registered tract. Neither of these licenses gives anything more than the right to inspect, explore,

and develop. If it is desired to conduct full mining operations and realize upon substances produced, what is called a "Working License" must be taken out, and in this the substance or substances expected to be recovered from the operations must be clearly specified. The general license is good for two years, costs about $20 and is indefinitely renewable at the same price for the same term. If it is desired by the holder to use on privately owned land the right to do so can be obtained from the government, if the owner refuses to grant it. This form of permit also allows of search on areas covered by a special or working license for all minerals not specifically listed in those documents.

The special license confers the exclusive right to search for all substances specifically listed therein, on a circular tract having a diameter of about 3000 feet, and containing therefore about 200 acres, provided the objects of search are the precious metals or stones. In all other cases the tract is a circle with a diameter of about 15,000 feet corresponding roughly to about 5000 acres.

In all cases priority of discovery determines priority of right to apply for a defined tract. A discovery stake must be planted with the date of discovery clearly inscribed thereon, and within 30 days thereafter written application must be made in person or by attorney to the Bureau of Mines. This application is posted at the Bureau for 40 days during which time all protests against its issue must be filed at the same place. If none appear the claim is usually awarded. But the law gives the authorities the right to refuse any and all applications in whole or in part, if, in their opinion, they conflict with previously granted rights of any kind. Any desired number of such reserved tracts may be applied for and secured by an individual or company. Their term is two years, renewable once for a like period. The cost in each case is about $40, and the right so acquired is transferable after the payment of a tax of 5% of the consideration passed each time that a transfer is made. The holder acquires no right under this license to realize on mineral found, but will be given that privilege to a limited extent upon request, and the payment of 10% of the gross value—at the mine—of all products sold.

At any time during the life of a special license the holder thereof may apply for and secure a working license, provided he can satisfy the authorities that he has sufficient capital at his command to operate the property properly. This license permits of the selection of a rectangular tract of any size desired, and disposed in any position selected, so long as it lies completely within the circular area covered by his special license. Whatever its date of issue it expires by limitation on March 11th, 1990, at which time, according to the contract in force between the Congo Free State and The Katanga Mines Company, the charter of the latter terminates.

If more surface is required outside of this tract for legitimate mining purposes in connection with the working license grant, the holder is able to secure it either directly from the Company, if the desired area is unoccupied, or from surface owners through the authorities who, if necessary, will institute condemnation proceedings.

Territory acquired by virtue of the working license cannot be sold or incumbered without the consent of the authorities, but if the consent is obtained a transfer fee of 5% of the consideration passed is payable. On such a concession the annual payments are as follows: First, 1% of the gross value of the product unless that amounts to less than about four cents per acre of its area, for all substances except precious metals and stone; and 5% of the gross value of the product in the case of these latter. Second, 33% of the net profits realized. But this tax may be compounded in the case of a joint stock company by the delivery of one-third of its shares to the authorities, and allowing them one Director on its board of Managers, with the further right to subscribe for 20% of any increase of capitalization that may be determined upon in the future.

Forfeiture occurs automatically in the case of all licenses upon the non-payment of any sum due to government, and if, at the end of two years after the issue of the concession, work in earnest and with all reasonable proper appliances and facilities is not in progress.

CYPRUS

In this island, which is a Crown colony of the British Empire, and where remarkably extensive remains of ancient mining operations—mainly for copper—exist, the mining law of Turkey governs, with such modifications as were made necessary by the transfer of the country in 1878 from Turkey to Great Britain, and such few ameliorations of the same as have since been ordered by the local authorities. This law, as will be noted by reference to it, makes scant provisions for the activity of prospecting, and the only form of mining property recognized is the concession, obtainable by direct application to and negotiation with the authorities. The terms and conditions of these grants, when given are, within certain limits, wholly matters of offer and bargain. The government requires a royalty of 5% on the selling value at the mine of all products, but a minimum of £500 is fixed, no matter how small the output may have been. Although the island abounds in workable deposits of lead, zinc, manganese, and other desirable minerals, and still has great resources in copper, its metallic production is insignificant, as might be expected so long as the industry of mining continues to be under the general system of the Turkish law, even as improved by the universally honorable methods of British rule.

DUTCH GUIANA (SURINAM)

(Law of September, 1882, with amendments to January 1st, 1917)

Only citizens of the Netherlands, or of the colony of Surinam, or companies legally organized under the laws of one of the two countries, and represented in Surinam by a legally authorized Agent, may acquire and hold mining rights in the colony.

Prospecting is not free, upon either Crown or private land except upon the latter by its owner, and then only after giving due notice to the Superintendent of the Crown Domain. When it is desired to prospect upon the former a written permit from the Governor is required, and for the latter the written consent of the owner.

All applications for prospecting privileges must be accompanied by the name, nationality, and legal residence of the applicant, and a map showing the relative position of the ground desired, and its area. Also a receipt from the Colonial Treasurer showing the payment to him of a sum equal to one cent per hectare per annum for the term desired. The application must be signed by all parties in interest, or by their duly authorized agents, or, if made on behalf of a partnership or a company, by its legal representative. No application may be for less than 200 nor more than 20,000 hectares. The Governor, sitting in Privy Council, has the right, for causes which seem to him sufficient, to reject any application.

The maximum term allowed is three years, which may be renewed twice for one year each time, making a possible total of five years.

Before the exercise of any rights granted by a prospecting permit, the document must be exhibited to the Commissary of the district in which the property lies, who is required to visit and verify the description, and, if everything is correct, to register it, which makes it effective. The holder then has the right at any time within its term, or any extension thereof, to select and stake off a part or the whole of the area, and to apply for the right to mine thereon.

A prospecting permit conveys the right to prospect only. It gives no authority to remove or realize upon any metals or ores found, but exploring shafts and other kinds of excavations may freely be made, and drill holes sunk. Assay samples may also be taken away.

To acquire the right to mine and produce from any part or the whole of a prospecting area, application must be made in writing to the Governor, accompanied by a receipt from the Colonial Treasurer showing the payment to him of a sum equal to the rental of the tract selected for the first year of the term desired. No mining permit will be issued for a period of less than one year nor more than 40, nor for a tract measuring less than 200 hectares. The rentals demanded are as follows:

For the first and second years of the term, 10 cents per hectare per annum.

For the third and fourth years, 25 cents per hectare per annum.

For the following years, 50 cents per hectare per annum.

Rentals are payable annually, and at least 30 days before the end of each year of the term. Failure to do this automatically terminates the franchise.

The area represented by any such permit, may, at the option of the holder thereof, be reduced at the end of any year of its term, by application in writing to the Governor made at least 40 days before the end of the year, by which a corresponding reduction of the rental for the next year is effected. But no reduction of area to a tract of less than 200 hectares is allowable.

Before application is made to the Governor for the permit to mine, a provisional notice of the application contemplated must be given to the Superintendent of Crown Lands, together with a map of the premises desired, which must be prepared and sworn to by a Crown surveyor, and said notice must be registered. Within two days thereafter it must be filed with the Governor. The applicant, or his legal representative must have a domicile in Paramaribo, the capital of the colony, the street and number of which must be given.

The Governor, acting with the Privy Council, is empowered to reject the application, in part or as a whole, in which case the rental paid in is in part or wholly returnable to the applicant. The latter, on his part, if he is not satisfied with the decision of the Governor in the matter, has the right to withdraw his application completely, and to recover the full amount of the rental deposited.

The right to mine, once granted, conveys all the usual rights and privileges appurtenant to the business, and the holder of the franchise may also engage in agriculture on the premises, to the extent of raising thereon food for the consumption of himself and employees, but not for sale to others.

Such mining concessions may be sold with the consent of the

Governor, who also, if supported by the Privy Council, may refuse to allow conveyance. If allowed, a transfer fee of two percent of the amount named in the deed is collected by the Government.

No royalties or other dues of any kind, except rental, are imposed by the authorities, but all gold recovered must be declared and sold to the Government, who pays for the same the standard price in coin or currency, less a moderate charge for melting, refining, and assaying.

When labor is sought, either in prospecting or mining, the business must be conducted in the presence of the Commissary of police, and in accordance with the rules and regulations connected with the employment of native labor, which in fact is the only class of labor attainable in the colony. Labor cannot be contracted for outside of the colony and brought in, nor may resident British Indian immigrants be employed in mining work. Each laborer whose employment is accepted by the employer and the Commissary of Police must be registered by name, the amount of wages payable to him agreed upon, the term of employment, and also the locality where he is to work. During this term the employer is responsible to the government for his health, good treatment, subsistence and proper shelter, as well as for his wages.

EGYPT

(Law of 1916, correct to January 1st, 1917)

The government claims exclusive ownership of all mineral substances, whether found on the public domain or upon privately owned land, and will not sell its mineral territory, but will grant long-term leases thereon in consideration of ground rent and royalty.

The law makes no provision whatever for the general prospecting of the country, and it would seem that any one is at liberty to make cursory inspection of the surface, at least upon unoccupied land. But no digging may be done without a License, and this license, when issued, covers a specified area over which, for the

time being, exclusive exploration rights are permitted. There are no such things as "claims."

The government issues three classes of mining franchises, to wit: the Mineral Prospecting License, the Mining Lease, and the Mining Lease Protection Agreement. These cover all mineral substances except petroleum and natural gas, for which slightly different provision is made.

The Mineral Prospecting license may be preceded by a "Reservation" which gives two months' exclusive protection and prospecting rights over a tract of land not already occupied and not more than one mile long and half a mile wide, at no cost except the registration of the tract as delimited by location stakes set up by the applicant, on the assumption that the tract is unoccupied, but it makes no guaranties to that effect. At the end of that term the formal Prospecting License must be applied for if it is desired to hold the ground, and a fee of 25 LE[1] (about $125) deposited. Any individual or corporation may take out up to four of these tracts if they are laid out in one contiguous and compact block. The fee for each is 25 LE. They confer tentatively the exclusive right to dig and explore, but not to remove or realize upon any material found, except in the way of samples for testing or display. The term is one year, with privilege of two renewals of the same period and at the same cost per annum, and the right to search for one metal or mineral only. Application for these is made to the Chief Inspector of Mines, accompanied by the fee for the first year, a sketch map showing the locality and surrounding land marks as accurately as possible, and the name of the substance to be prospected for. Within 60 days after date of issue the applicant must apply for an official survey, and deposit the estimated cost of the same, which will be not less than 25 LE. Until this is made and approved only preferential rights exist, and the government reserves the right to refuse its issue in case the survey develops the fact that the tract may be or is more suitable for other uses, or is partly or wholly already assigned

[1] The letters LE signify the Egyptian pound (£), which has about the value of $5.00 U. S. gold.

to others. If granted the applicant must begin exploring work in earnest before the end of the first yearly term, and continue the same thereafter with reasonable diligence. If he holds more than one prospecting area arrangements can be made with the authorities by which working conditions for all may be performed at one point if desired. Monthly reports, giving full particulars of operations are required. A technically educated manager must be in charge of the work, and the holder is liable for a reasonable share of the expenses of keeping order in the district. No conveyancing rights exist for the ground covered by a prospecting license until a specified sum—agreed upon at the time of issue—has been expended in prospecting, and the amount of the same endorsed upon the license by the Department of Mines, and then only upon the payment of a registration fee of 5 LE (about $25).

At any time during the term of a prospecting license or its extensions, the holder thereof has the right to demand a lease of the whole or any part of its area. In shape this leased tract must be a rectangle, with length not greater than twice its breadth. The term allowed is 30 years, with an extension of 10 more. The ground rental in the case of a sedimentary deposit (alluvials or coal, etc.) is 1 LE per acre per annum, and for a lode deposit 2 LE. In addition, for all substances, 2% royalty is required on the gross value of the output at the mine. Work must begin within four months of date of issue, and thereafter be practically continuous and reasonably energetic. As in the case of the prospecting license a technically educated manager must be in control of the work, monthly reports presented, share of district policing expenses paid, complete maps kept, and two copies supplied annually to the authorities. A lease gives full mining and selling rights for the product, but is good for one metal or substance only. If others of commercial value are found, and it is desired to recover them, new arrangements must be made before production and sale may occur. No conveyancing rights exist in the case of the lease except with the consent of the Minister of Finance.

If ground outside of the area of a lease is desired for any pur-

pose legitimately connected with mining or metallurgy, such as machinery or reduction works sites, tramways, residences, etc., it is obtainable on reasonable terms on application to the authorities. As soon as a mining lease is issued all rights connected with the prospecting license which preceded it cease automatically.

If the area included in a lease does not cover the area comprised in the prospecting license on which it was based, and the holder of the lease desires to further prospect the surplus area, he may secure exclusive exploring rights on the same by applying for what is called the Mining Lease Protection Agreement, which is practically a new prospecting license on the excess area. The fee for this is 10 PT[1] (about 50 cents) per acre per annum in the case of a sedimentary deposit, and 25 PT in the case of a lode deposit. In all other respects the conditions, rights, and obligations are identical with those already mentioned for the License.

The holder of a mining lease who desires to surrender it and abandon the property, must give the Department of Mines six months' notice of the intent before he can be relieved from the obligations and duties of the franchise.

For petroleum and natural gas the prospecting area allowable is a rectangle, no side of which is more than two kilometers in length. The term is a year, with two renewals of equal length at the option of the Department of Mines. The cost or fee is 25 LE per annum, and all the other conditions, obligations, and rights are practically identical with those of the mineral prospecting license. No realization on the value of product is permitted until a lease is taken out. The fee for the latter is 2½ LE per hectare per annum (about $5.00 per acre), and the royalty 7½% on the gross value of the product at the point of production.

FEDERATED MALAY STATES

(Law of 1911, with amendments to January 1st, 1917)

In this British dependency, which includes the native states of Perak, Negri Sembilan, Pahang, and Selangor, mining rights

[1] The letters PT signify the Turkish piastre, which is worth about 5 cents.

of all kinds are controlled exclusively by the central government (with the exception of certain tracts called "ancestral land" in the state of Perak which have been held for many years by a few native families), and are open for occupancy and usage under the annual and long term leasehold systems, in consideration of ground rent, royalty, and export duty on products, and a compliance with the rules and regulations prescribed for the safety of employees and matters of sanitation.

Prospecting is not free. A license is required which costs from $25 up, according to circumstances, and is good for such a term as may be agreed upon when issued. A fine of $1000 is imposed on anyone found prospecting or mining without the document. Application for it is made to the chief official of the local Land Office, and must be in writing. Therein the tract desired must be described and located, and the metal or mineral expected to be found stated. All details are matters of negotiation with this official. A suitable sum must be deposited to defray the cost of the delimitation of the tract, and of such an examination of the status of the title as may be deemed necessary. No application insures the issue of the grant, nor even priority of its consideration over another for the same area filed later. If allowed, the applicant must specify the amount of land within its lines—not to exceed half its total area—for which he desires the prior and exclusive right to call for a long-term lease, in case his prospecting operations result in the discovery of payable mineral in sufficient quantity to warrant permanent operations. Under such a license the holder thereof may explore and realize upon material found, by the payment of such royalty or export duty on the output as the terms of the contract specify. During this preliminary period of occupation all operations must be carried on to the satisfaction of the district Warden and his Inspectors, and with their full knowledge.

At the end of the license term, if the licensee desires to continue work, he may apply for a long-term lease for that proportionate area of the tract specified in the license; and if the Resident is satisfied with the way in which he has been conducting his explor-

ing operations, and is of the opinion that mining there can be made profitable, he is empowered to grant the lease. He also has full power to decline to do so for reasons satisfactory to himself.

Another form of mining title is called the "Individual Mining License." This confers mining rights on small sized tracts (like mining claims) but may be given only on land within the limits of a large tract which the Resident has previously proclaimed to be a mining field. Each license costs $5.00, and expires automatically at the end of the year of its date of issue. It is neither transferable nor renewable although a new one for the same tract may be issued, and under it all work must be carried on "in such manner only as may be approved by the Warden or an Inspector." The size and terms are wholly matters of arrangement between the applicant and the authorities.

Long-term leases are obtainable by direct application in writing to the Chief of the Land Office, with whom all details of area, term, rental, royalty, and working conditions are arranged. This official also has full power to reject any application without explanation. If his approval is secured a survey is required and all boundary monuments must be placed before the formal lease will be delivered. When issued, it conveys full mining and realization rights on all metals and minerals found within the lines, together with the right to use as much of the surface as, but no more than, may be necessary for legitimate mining purposes. Ground rent is always payable in advance. Monuments must be maintained in good repair. Mining in earnest must begin within six months, and by the end of twelve months at least one laborer per acre of the leased tract must be kept constantly at work.

FRENCH GUIANA (CAYENNE)

(Law of March 10th, 1906, with amendments to January 1st, 1917)

For the purposes of the law all mineral substances are classified under the three headings of Quarries, Placers, and Mines.

Quarries are deposits of material used in constructive or orna-

mental architecture, fertilizers, and other analogous substances, with the exception of nitrates and other salines. In general this class covers solid or stable deposits that may be worked in the open, and without processes for underground mining. When occurring on alienated land they belong irrevocably to the owner thereof.

Placers are deposits in the surface soil (if the latter is not a distinct geological stratum other than alluvial) yielding metals or precious stones. These, wherever found, belong to the nation, and the right to work them can only be procured by means of a government permit. When such a permit is acquired all mining rights cease when the underlying bed rock is reached.

Mines include all other kinds of mineral deposits. Like the placers they are the property of the nation, and the right to work them can be obtained only from the government. When such a right is granted it covers all the substances that may be found within the boundaries of the grant, excepting placer deposits in the surface soil.

The various substances on which mining rights may be obtained are divided into three categories, as follows:

1. Combustibles (coal, oil, natural gas, asphalts, and allied materials).

2. Rock salt and other salines, mineral springs, nitrates, and phosphates.

3. All other substances, except the class of quarries occurring on alienated land, which belong to the owner thereof and cannot be the subject of a government grant. All other mineral substances may be, no matter where found.

Permission from the government to mine any one substance conveys also the right to mine for any other substance of the same class found within the lines of the granted area, but for no substance of any other class.

All individuals capable of holding property in the colony, whether citizens or aliens, may acquire the right to mine. But aliens must previously establish their identity, and must either have a legal domicile in Cayenne, the capital of the colony, or a

legally appointed representative there. Companies must be established in conformity with French law, and must have a legal residence or representative in the capital.

Prospecting is not free. A permit is necessary. It costs 50 francs, is good for one year, and is renewable indefinitely at the same price. It simply confers the right to make preliminary investigations and explorations on the public domain and on alienated land, but does not give any claim-locating right. In fact the law does not provide for mining claims of any specified size. The hectare (about 2½ acres), however, is the unit of measure of areas, and no mining claim may measure less than 200 of these units or more than 1000 of them, excepting placer claims, which run from 10 to 250 hectares. In shape the claim must be rectangular, with the smaller sides not less than one-quarter the length of the longer ones, and the tract must be orientated to the true meridian.

The procedure for acquiring mining property is as follows: A prospecting permit is first taken out, the holder of which is called a "permissionaire." When after prospecting a region a discovery (or an indication thereof) is made, the permissionaire plants a stake at the place, on which is inscribed his name, the date of planting, and the particular substance which he believes he has found. He then makes formal application to the Bureau of Mines for an exclusive prospecting area, which will be granted in the shape of a circle with a diameter not to exceed four kilometers, the center of the same to be the discovery stake erected. Application for this area must be made within three months of the date placed on the discovery stake, and it will be granted or refused within five days. The cost is 40 centimes per hectare of area per annum. It is renewable—at the option of the government—at a cost of 50 centimes per hectare per annum for not over three more years.

Areas of this kind may be located on either public or private land, but in the latter case the consent of the owner must first be obtained if possible, and a bargain made with him for indemnity for any damage that may accrue. If no satisfactory ami-

cable arrangement can be made, the prospector can apply to the Governor, who, acting through the Bureau of Mines, will secure a reasonable contract with the soil owner.

Having secured such an area the holder has the right at any time during its term (or the extensions thereof), to apply for a defined tract within its limits not less than 200 hectares or more than 1000, upon which to conduct mining operations. This grant is called a concession, and the holder of one a "concessionaire." In applying for it a map of the locality on a scale of 1 to 10,000 must be presented, and the class of substance to be produced must be stated. Simultaneously the first year's rental is payable. This is figured at the rate of 60 centimes per hectare up to 500 hectares, and 75 centimes per hectare from 500 to 1000 hectares. Thereafter renewals may be obtained indefinitely by the payment annually in advance of 100 francs per hectare for all areas up to 100 hectares, and one franc for each hectare over that amount.

Mining areas so obtained must be marked by posts set at all corners in the following way. A hole one meter in diameter and one meter deep is excavated, the post set at its center and projecting at least one meter above the surface, and the hole then filled with stones. On each post must be inscribed the name of the claimant, the date of the issue of the grant, and its number. The application for such a grant is at once registered at the office of the Bureau of Mines and a receipt given for the first year's rental. The papers then go to the capital of the colony, the application is advertised in the official Gazette, and if no objections to its issue are filed within a term of six months, the grant is executed by the Governor and the title is complete.

The right to claim a concession accrues only after a prospecting area has been applied for and obtained, and at least two-thirds of the concession must be within this area. The other one-third may be outside of its limits if there is free land on which to place it.

In the case of placer locations the area permitted is not less than ten nor more than 250 hectares, but as many of such tracts as desired can be applied for by anyone who has taken out a pros-

pecting permit, and who has therewith applied for and secured a prospecting area. Claimants may begin work at once after application, and may continue working during the period usually required for confirmation (six months), subject however to stoppage and restitution of values recovered meantime if for any reason the concession is not allowed. When allowed, a placer concession is good for a term of six years, and is indefinitely renewable for terms of the same length, subject to the payment of the annual rental.

Recording, surveying, and other fees and charges connected with applications for prospecting and working rights are reasonable.

On privately owned land, or on government land under lease for agricultural, grazing, or other purposes, the owner or tenant may prospect and mine without formally applying for an area.

On all concessions granted, energetic work in good faith must begin within six months from date of grant, and be maintained thereafter with reasonable persistency. All stakes and monuments must be kept in good order at the expense of the claimant. If a "permissionaire" or a concessionaire desires to abandon his property, notice of the intent must be given to the Bureau of Mines a year in advance of the act, and at the time of the abandonment all stakes and notices must be carefully removed.

On alienated land locators must arrange with the owners thereof for surface rights. If the latter are unreasonable in their demands appeal may be had to the authorities, who will secure equitable terms. On the public domain, if not leased for other purposes, full surface rights go with the mining grant. Upon leased public domain, if satisfactory terms cannot be secured from the tenant, the miner may use what surface he needs provisionally, pending adjustment by the authorities.

The prospecting permit does not give to the "permissionaire" the right to realize in any way on ores or metals found. But as soon as a defined area is selected, and the rental for a year paid,

all material lawfully found may be converted into money. As soon as a concession is issued, the prospecting area that preceded it automatically becomes void and non-existent.

All miners must keep books of account, in accordance with models prescribed by the law, also working plans of the mine. These must be open for inspection to the authorities at all reasonable times. Also, annually, a statistical report of operation must be made out and sent to the Chief of the Bureau of Mines.

GOLD COAST AND ASHANTI

(Law of 1900, amended to date of January 1st, 1917)

Mineral rights of all kinds in this part of the British Empire are vested in the native chiefs, without whose consent no mining privileges are obtainable, but whose power to confer such franchises must be ratified by the local colonial government.

Prospecting is not free. A license is required, for which application is made to the Governor through the Secretary of State, who, if approving it, forwards the papers to the Resident of Komasi, the capital. The latter also may approve or decline at discretion. If he adopts the former course the local native chief of the region in which the applicant desires to prospect is notified, and requested to afford facilities. The cost of the document is £10. It grants no exclusive rights, and is good for three months only, but is indefinitely renewable—at the option of the Resident—at the same price and terms. It permits surface inspection and exploration only, but the holder may take away such samples and specimens as may be necessary to test or display values, provided all such material is declared to the Resident, and also the place or places from which they were taken correctly described.

The holder of such a license having made a discovery of importance which he desires to operate, has the right then to negotiate with the local native chief for an exclusive area and for mining privileges thereon. When these negotiations are complete the applicant and the chief appear before the Resident at the capital,

and all terms of the bargain are considered by the latter, and, if necessary, modified until satisfactory. The agreement is then reduced to writing and signed by all three parties. No concession may exceed five square miles in area, or have a term greater than 99 years. The annual rental and royalty decided upon are payable to the chief through the colonial Treasurer.

All concessions must finally be examined and ratified by the High Court of the colony, and before becoming valid must be advertised in the government Gazette and registered. All expenses, including survey, are at the cost of the applicant.

There is no limit to the number of concessions which an individual or corporation may apply for and acquire, except that the combined area of the same at any one time must not exceed 20 square miles. After registration conveyancing rights are complete, but the transfer must be accomplished through the government recording office, and on each a tax of £1 per acre of area—or fraction thereof—is collected.

In addition to the rentals and royalties payable to the local native chief or chiefs, a royalty of 5% on all divided profits is payable to the colonial government.

A penalty of £50 is imposed on anyone found prospecting without a license, and a still heavier fine for attempting to negotiate with a native or a native chief without first taking out such a permit.

Default in the prompt compliance with any of the terms of a concession renders the holder thereof liable to a fine of £5 per day for each day during which default continues.

HAITI

(Law of December 10th, 1860, amended to date of January 1st, 1917)

For the purposes of the law all mineral substances are classified as Mines, Placers, or Quarries.

Mines include those substances existing underground in rock, in the form of veins, beds or masses, such as ores of the metals, coal, oil, gas, asphalt, graphite, rock salt, baryta, fluorspar,

sulphur and other analogous minerals. These, whether existing on the public domain or on alienated land, belong to the Nation and are subject to appropriation by individuals and corporations under the provisions of the law.

Placers are deposits of metals or minerals occurring in the surface soil, such as gold or tin-bearing gravels, bog iron ore and ochres, pyritiferous and aluminous earths and analogous substances.

Quarries are deposits of building stone of all kinds, also beds of gypsum, brick, and pottery clay, cement rock, chalk, sand, and phosphates.

When Placers and Quarries exist on the public domain they belong to the Nation, and mining rights may be acquired upon them through the law. But when occurring on alienated land they belong to the surface owner, and can only be worked with his consent.

Mines and Quarries on the public domain may be worked only under the provisions of a grant from the Secretary of State, and under rules prescribed by the Interior Department. When they are on private land the consent of the owner must be obtained or, if that is not given, authority of the government coupled with provisions for a satisfactory indemnity to the surface owner. In the latter case the applicant for mining privileges is required not only to prove the existence of a mine, but also to show that it can be profitably worked.

Prospecting is free to aliens as well as to citizens of the Republic, but parties conducting exploratory work may be called upon at any time to prove that they are financially able to carry it on, and also to respond to a suit for damages. Before entering upon alienated land the owner thereof must be given a month's time to file objections to the application.

The law provides no stated area for mining claims, nor procedure for making locations. All such matters are arranged by direct negotiations with the authorities. No extralateral rights are allowed, and no conveyancing is possible without the consent of the authorities. The right to mine for one substance only is

conveyed by a permit. If others are found, new arrangements must be made.

Titles are maintained by an annual rental and a royalty on the gross output, and the amount of each is a matter of negotiation. Fairly continuous work is expected, and when the area under operation is on alienated land, the soil owner has the right to claim a portion of the output to be previously determined by the government, but not less than 5%. The normal term of a mining grant is one year, which, on the public domain, will be renewed indefinitely on the same terms as granted. If on private land the soil owner can refuse renewals, in which case the miner has the right to purchase at double the normal value.

JAPAN

(Law of 1890 as revised in 1900)

The Nation claims the exclusive ownership of all deposits of gold, silver, copper, lead, bismuth, tin, antimony, mercury, zinc, iron, manganese, arsenic, iron sulphate, chromic iron, phosphates, graphite, coal, lignite, petroleum, natural gas, asphalt, and sulphur. All other mineral substances belong to the owners of the surface.

There being practically no public domain, free prospecting is not allowable, excepting upon one's own land, and even then it must be confined (so far as nationally owned minerals are concerned) to an inspection of the surface. To explore to a further extent a prospecting permit is required, but must refer to a definitely described area. Anyone who has noticed indications of the existence of ores of any of the substances mentioned in the above list, and who desires to inaugurate exploring operation thereon must, even when he is the surface owner of the place, apply to the authorities (a Bureau of the Department of Agriculture and Commerce) for a permit, giving a correct description of the position and area of the tract desired. If he is the first applicant for the privilege it cannot be refused. When given, it is valid for one year, but an extension of the term is allowable

under certain particular conditions. While operating under this permit the explorer may realize on minerals found by obtaining the permission of the authorities, and upon the payment of such rental and royalty as would be due if the permit under which he is acting was one for mining. If, during the term of his occupancy, application is made for such a grant, his prior right to the same is recognized. Otherwise it is given to the first applicant. Whoever makes the application is required to demonstrate the existence of the mineral which is the object of the search, within the boundaries of the tract asked for.

The authorities, however, reserve to themselves, under the doctrine of eminent domain, the right to refuse the issue of prospecting permits and mining grants, and, without the right to appeal to the courts, to revoke and cancel any already issued if, in their opinion, the franchise asked for, or already granted, is considered or has proved to be "injurious to the public interest." To date this reservation of autocratic power has never been exercised unfairly or unusually, so far as can be ascertained.

By an extension of this doctrine the authorities also reserve the right to direct work on a mining grant so as to conform to "necessary public interests." Annually a general approximate program of proposed operations must be submitted for approval, and when approved must be executed with a reasonable degree of approximation, under penalty of forfeiture of the franchise. In general this control relates only to matters affecting the comfort, safety, and health of employees, but it may go farther and specify the maximum and minimum tonnage production, the extent of new development required, and insist on other provisions having for their object the maintenance of the property and its appurtenances in good state of repair.

Forfeiture automatically results when it can be proven that the grant was obtained by fraudulent representations during application, or when, to improve working conditions, changes in the boundaries of the grant are made and the grantee refuses to be governed by the change; or when the ground rent and royalty are not paid promptly when due.

The areas obtainable for prospecting or mining purposes in the case of coal cannot exceed about 500 acres, nor be less than about 8¼ acres. For all other substances the size is about 25 acres. In shape all mining tracts must be rectangular. None carry any extralateral rights. But if, after operating some time, it becomes apparent that the ore body under development in its extension downward is liable or about to pass beyond planes projected vertically downward through any of the surface lines, the grantee can ask for a change in these lines, and the authorities have the power to make the change, provided the request is in their opinion reasonable, and does not injuriously affect the rights of others. Grants of both kinds must be registered, after which conveyancing rights are complete.

On all areas granted for prospecting purposes the holder thereof has the prior right to apply for a mining grant, provided he does so before his term expires.

The mining grant, when issued, is of the nature of a perpetual franchise, at the option of the holder, incapable of annulment except for the three causes above specified, or under the doctrine of eminent domain. Prospecting and mining are prohibited within a distance of about 1650 feet from cemeteries or military or naval reserves; or within a distance of about 175 feet from public monuments, wagon roads, or rail roads, lakes, springs rivers or marshes, except by special permit.

All surface operations which are objected to by the owner of the soil must be suspended until the authorities have investigated the circumstances, and either allowed them, or substituted some suitable modification; or the surface owner can be compelled to sell his rights to the mining operator, or grant an equitable lease; or, finally, the operator can be compelled to give satisfactory security for possible damages or injuries to the premises or the business of the soil owner. All such matters must be referred to the authorities for arbitrament, and cannot be made causes of litigation in the courts.

Surface owners cannot claim any interest in or royalty from the production of any of the metals or minerals specified at the begin-

ning of this digest. The State, however, collects two kinds of taxes or imposts, first a fixed annual rental of about 35 cents per acre, and second a royalty of 1% of the value (at the nearest market) of the output in any and all forms, excepting in the case of iron, which is exempted from all internal duties and imposts.

MYSORE (BRITISH INDIA)

(Law in force September 7th, 1916)

The ownership of all precious metals and stones, and of all other mineral substances except granite, limestone, trap, kankar, sandstone, slate, quartz, laterite, and brick clay, wherever found within the province, either upon public or private land, is absolutely vested in the government except in the case of certain tracts where the mineral rights have been expressly granted to surface owners. On all areas so controlled the search for minerals can only be conducted by holders of licenses, and permanent mining operations by holders of leases.

The government issues three varieties of licenses called respectively Collecting, Exploring, and Prospecting Licenses.

The Collecting License applies only to precious stones and to the mineral corundum. It is good for one year but is renewable for additional terms of the same length at the discretion of the authorities. It conveys the right to search for, collect, and dispose of gems and corundum when found upon or within such a distance from the surface as is specified in the document. It covers any area agreed upon between the applicant and the government not in excess of that political subdivision of a District which is called a taluk, the size of which is variable but roughly approaches that of a township in the United States. The fee on application is $3.20. In addition a deposit is also required of an amount set by the authorities in accordance with the conditions existing, which may vary from $10 to $100. It confers no exclusive rights but allows the searcher to work deposits found, and dispose of his product upon payment of a royalty of $2.75 per ton of 2000 lbs. of corundum and 30% of the net

profits on precious stones. These licenses are not transferable and do not allow explorations on ground already occupied for mining or any other purpose, and the searcher must apply for a permit to sell his product before putting it on the market.

The Exploring License conveys the right (but not exclusive) to search for minerals of all kinds, and to do such digging and make such excavations as may be necessary to expose and remove any small quantities of substances found and desired for purely experimental or testing purposes, but with no right to realize upon the values of the same. Nor does it give any preferential right to claim a lease on a deposit of ore found, except such as may be recognized at the option of the authorities. Its term is one year, with no renewal right. But a new license may be granted if the government is disposed to do so. The maximum area allowable is that of a political District, which may be likened to that of a county in the United States. The fee on application is $3.20. No deposit or surface rent is asked, and the government reserves the right to reject any application without cause, to limit the area as it may see fit, and also to confine its validity to any one or more minerals that it may select. This form of license is not transferable. If any precious stones are found the fact must be reported within ten days, the stones exhibited to the authorities, and a royalty of 15% ad valorem paid upon realization.

The Prospecting License conveys full and exclusive mining and selling rights within the area it covers, and for the mineral or minerals specified in the document; and also the right within its term or extensions to select a tract not exceeding one square mile in size, and to call for a lease on the same. Its term is one year which, at the discretion of the authorities, may be renewed from year to year until in their opinion the holder has had sufficient time to make the selection with intelligence. The area covered by the license may not exceed ten square miles and should be as nearly a rectangle in form as possible, whose length is not more than twice its breadth. The fee on application is $3.20 per square mile (or fraction thereof) of area included, in

addition to which a deposit of $32 per square mile is required, and a surface rental ranging from two cents to 16 cents per acre per annum, according to the discretion of the authorities. The royalties on substances disposed of are as follows:

On gold and silver. No royalty is taken until operations show a net profit; thereafter 5% per annum of the gross sale value of the products, plus 5% per annum for each $125,000 of net yearly profits divided.

On all other substances except corundum and precious stones, 5% of the selling value at the mine.

On corundum, $2.75 per ton of 2000 lbs.

On precious stones, 30% of the net annual profits.

Claimants under prospecting licenses may not use the timber on the surface without a government permit, but may erect such buildings and sheds as are required for economical temporary operations, and construct such roads and trails as may be necessary to secure access to their premises.

Leases. The maximum term of a mining lease is 30 years, with one renewal of equal length at the option of the authorities, and on such new terms as they may prescribe. Its area cannot exceed one square mile laid out in rectangular shape, with length not greater than four times its breadth. In the case of alluvial deposits of precious stones or of any of the metals, the government reserves the right to limit both the area and shape in accordance with its own views of the necessities of each case. The fee on application is $32, and a deposit of $320 is also demanded. The surface rental is 32 cents per acre per annum. The royalties are the same as in the case of minerals sold under prospecting licenses. In addition to these charges the authorities reserve the right to levy an impost called a "dead rent" wherever a leased property is not being operated as energetically or skillfully as, in their opinion, it should be. This may be as much as, but not more than, $1.60 per acre per annum. But it can be levied only when the royalty paid for any one year is less than what the dead rental would be at its maximum rate.

All expenses connected with the issuing of a mining lease, such

as surveys, examination of title to the tract asked for, maps, etc., must be paid for upon delivery of the document, leaving the deposit of $320 as security for the prompt and accurate performance of the terms of the grant. There is finally a stamp tax to be paid upon the document itself, and a registration fee. Leases may be sold or encumbered upon obtaining the consent of the authorities, the payment of the transfer fee, and the registration of the document of conveyance. But the government reserves the right to refuse its consent, without cause.

Operations must begin in earnest within a year from date of grant, and thereafter be continuous. All boundary monuments must be kept in repair. If the lease is on alienated land arrangements must be made with the owner thereof for all surface privileges required, but if harsh terms are asked the authorities on request will initiate expropriation proceedings in the courts. Complete accounts and working maps must be maintained.

NIGERIA

(Law of March 31st, 1916)

In this British colony the government claims the exclusive ownership of mineral substances of all kinds, and wherever found within its borders; and, for the purposes of the law classifies them as Alluvials, Lodes and Minerals. The last is again divided into Metalliferous Minerals, Carbonaceous Minerals, Earthy Minerals and Precious Minerals. In the final division are precious stones and the metals gold, silver, platinum and iridium.

Prospecting Is Not Free. A license is required, and a penalty of $500 or 12 months' imprisonment is prescribed for any one attempting to add to the mineral wealth of the country without formal permission, together with confiscation of all material obtained. Natives however are freely permitted to explore for and appropriate to their own use iron ore, salt, soda and potash, when found on unoccupied land.

Two forms of exploring permits are issued, called respectively

"Prospecting Rights" and "Exclusive Prospecting Licenses." The first may be taken out by any individual—citizen, alien or native—who is over 18 years of age, can read, is of good character and can furnish satisfactory proof to the authorities that he can command sufficient capital or credit to carry on exploring work properly, and to respond to claim for damages that may accrue as the result of his operations. But the right is reserved by the Government to prohibit the search for any specified mineral at any time, by advertisement in the Official Gazette, which prohibition, when exercised, applies not only to "Rights" issued thereafter, but also to all those at the time in force.

These "Rights" are good for one year from date of issue, cost $25.00, are not transferable or renewable, and convey no permission to remove and realize upon any material found. They confer the right to explore upon unoccupied public land and privately owned property, excepting in the first instance upon areas closed by official proclamation or included in an exclusive prospecting area, or has been declared a forest reserve. In the last case permission to prospect may be obtainable from the local forest officer, upon proper guarantees. Each employee or partner of a prospector must also possess a "Right."

The "Exclusive Prospecting License" is granted only to one who has first taken out a "Prospecting Right," and who has either personally or by an employee conducted exploring work upon the area asked for. The maximum tract allowable is sixteen square miles, but when the search is for precious metals or stones it may not exceed one square mile in area. The permit is good for one year and is renewable—at the option of the authorities—for three additional years in the case of an alluvial deposit, and for six in the case of lodes. The cost is $25.00 per square mile of area per annum, payable in advance, plus all costs connected with the necessary surveying and mapping. The applicant is also again required to give proof that he has sufficient capital at his command to carry on work properly, and to respond to any damages that may result to private or government interests. Such a license confers exclusive exploring privileges within

the area granted, for the holder and his employees, provided the work is prosecuted continuously and to the satisfaction of the authorities, but does not allow of the removal or sale of material found, except of small quantities for testing purposes.

When an alluvial deposit has been found by the holder of a prospecting license or right, and it is desired to operate thereon, the discoverer must apply for what is called a "Mining Right." This may or may not be granted, the authorities having full discretionary powers in the matter. If granted, it is good for one year, and is renewable from year to year thereafter at the option of the Governor. The maximum area allowable is one mile in length of the bed or channel of the stream, by one hundred yards on each side of its center line. No survey is required, but the claimant must carefully stake all corners. A rental of $5.00 per annum for each one hundred yards of the length of the claim is payable in advance. On the product royalties range from 2½ % to 7½ % on tin ores, are $1.00 per ounce on gold, and on the other precious metals 5% ad valorem. The conditions of maintenance are "continuous and adequate operation." At any time during its term the government has the right to revoke the franchise upon 30 days' notice, in whole or in part, in which event the holder has a preferential claim for a lease on the area revoked, and for a new mining right on the balance.

For all other varieties of mining operations Leases must be taken out. The maximum term permissible is 21 years, with a claim for one renewal of an equal length if the holder has been operating to the satisfaction of the Department of Mines, and can give proof that he is capable of continuing to do so. Beyond this no further extension can be obtained. Leases may be sold or assigned with the consent of the authorities, and on payment of a transfer fee. They may also be surrendered after giving six months' notice of the intent, the settlement of all legal claims which may exist at the date of abandonment, and the payment of a surrender fee.

The holder of a mining Lease has full right to remove and sell all minerals found and produced during its term.

Leases are of five different kinds, as follows:

A. Metalliferous Minerals and Precious Metal Lode Leases. These can embrace an area not less than five and not more than fifty acres. The annual rental is about $2.50 per acre, and the holder may work and own any alluvial deposits on his area.

B. Metalliferous Minerals and Precious Metals Alluvial Leases. The area of these may be from five to eight hundred acres, according to the nature of the deposit, its topographical features and the methods of operation that must be adopted. The rental is about $1.25 per acre. This form of lease confers the right to work only in the surface soil or débris.

C. Precious Stone Leases.

D. Carbonaceous Minerals Leases.

E. Earthy Mineral Leases.

For these three classes the areas obtainable, the terms and the surface rentals are (within certain limits) matters of negotiation between applicants and the authorities.

Royalties are payable on all minerals and metals produced and sold as follows: On tin products, from 2% to 7½% according to the current price in London. On lead products, 2% to 5% ad valorem according to the silver contents. On iron products 1% ad valorem. On gold, $1.00 per fine ounce. On other precious metals, 5% ad valorem. On all other minerals and metallic products such rates as may be agreed upon between the authorities and the producers, or as may be fixed by future Regulations.

The shape of all leases must be either rectangles or polygons. In the former case the width must not be less than 200 yards. In the latter there must be at least four sides and not more than ten. In all cases the boundaries underground are vertical planes passing through the sides. Lessees have the right to work for and realize upon only such substances as are specified in the document. If others are found and it is desired to produce them, the authorities must be notified and the lessees must accept such regulations for their recovery and disposition as may be decreed by the Governor acting under the advice of the Department of Mines.

Maintenance depends upon practically continuous work with a force of not less than five laborers for every two acres in the tract in the case of a lode property, and the same number for every twenty acres in the case of placers. When operating on alienated land a royalty or rental for surface areas used can be claimed by the surface owner. The amount of this is largely a matter of negotiation, but the authorities reserve the right to insist upon its reasonableness according to their views in such matters.

SIAM

(Law of 1901, with amendments to Jan. 1st, 1917)

The government claims the exclusive ownership of all mineral substances, upon, in or under the surface, and whether existing on the public domain or on privately owned land.

Prospecting upon alienated land by the owner thereof is free for a term of ninety days, at the expiry of which—if it is desired to continue operations—a lease must be taken out. During the exploring term no mineral can be removed from the immediate vicinity of the place where it was found.

When a discovery of any desirable mineral substance is made in the surface soil by anyone other than the surface owner, and it is desired to operate thereon, application must be made for a Mineral Washing License, which can be obtained at moderate cost, is good for one year and is renewable thereafter indefinitely at the option of the government at the same cost. It is not transferable.

General Prospecting Is Not Free. Licenses are required. These are issued at small cost, are good for a year and cover an agreed area (generally one of the small political divisions). They are not exclusive, but confer the right to prospect over all parts of the region not already occupied by other prospectors or miners, and not in actual use for buildings, crops and fenced pastures. They are renewable from year to year at the option of the authorities, are not transferable, do not confer the right to remove or sell any mineral found and are good only for the individual to

whom they are issued. Additional licenses must be taken out for partners or assistants employed.

An exclusive prospecting license is also obtainable, good for one year and renewable once at the option of the authorities. The ground desired—which cannot exceed about 1000 acres—must first be staked out. The applicant then presents a sketch plan to the chief local authority, together with the prescribed fee and a deposit in addition to cover the costs of identification, etc., and in due time if the applicant is considered to be a desirable party and the area is vacant the license may be issued. It conveys full exploring rights to the holder with the privilege of employing as many assistants as desired without any additional licenses, but confers no right to remove or realize upon any mineral found.

For Permanent Operation A Lease Is Necessary. Application must be made in writing accompanied with a sketch plan of the ground desired, the prescribed fee and a sample of the mineral or minerals found and which it is expected to operate for. The applicant must give satisfactory proof of his technical ability to conduct mining operations in good style (or name a Manager with those qualifications) and must show that he can command sufficient capital. If the lease is granted, all its terms are matters of negotiation between the government and himself. A ground rental is charged which is payable semi-annually in advance. Royalties in varying amounts are payable on all material sold. Areas may not exceed about 33 acres for a lode claim and about 100 acres for a placer or coal claim. Each tract must be rectangular in shape, orientated and with length not in excess of three times its width. A survey by a government engineer at the cost of the applicant is obligatory, and all monuments set during this operation must be maintained in good order. Maintenance of the franchise from year to year thereafter is dependent upon conducting operations with reasonable energy and in ways satisfactory to the Department of Mines, whose constant supervision must be acknowledged. Within six months after the abandonment of a lease all buildings, machinery, ore or other property must be removed, or it becomes the property of government. Leases may

be transferred, but only with the consent of the authorities, and upon the payment of a stated transfer fee.

BRITISH NORTH BORNEO

The government claims the exclusive ownership of all minerals, whether found on or below the surface, and prohibits the search for them except by holders of a government license, under penalty of $500 or six months' imprisonment. No form of title exists for mining property except that of a lease.

Licenses to prospect and leases to operate may be obtained from the authorities at Sandakan, the capital, and on generally reasonable and fair terms. They are largely matters of negotiation excepting in a few fundamentals, which are substantially those of the British India law.

CHAPTER XIII

The Prospector

A mining law has for its purpose the attainment of two ends, namely, to secure the discovery of mineral deposits, and to encourage and govern their development and operation. The first has to do with the occupation of prospecting, while the second is a matter of capital and mining engineering. As mines cannot be worked until they are discovered, it seems clear that the paramount object of a law of this class must be to stimulate the business of the prospector.

This individual, as known in America, may be said to be entirely a product of its peculiar civilization. In dictionaries of the English language published prior to the year 1850 the word is not to be found. It seems to have become current first about the years 1845–50, when, lead ore having been discovered at Galena, Illinois, a number of the pioneers of the vicinity began to search the surrounding country for more of the mineral. These individuals appear to have been called "prospectors" by a writer of the day. Shortly thereafter the gold discoveries in California were announced, which naturally drew all such characters to the Coast, where their line of activity was at once recognized as desirable, and the title appropriate. The idea back of it was a totally new one to the world, for it meant an individual who had been invited by the nation to explore the surface of the public domain for indications of mineral values of any kind. These, when found, if not on land already appropriated by another, became by the miner's law the exclusive property of the finder, to work or to sell as he saw fit. In a short time the occupation became entirely one of searching and finding, the idea of develop-

ment being quite abandoned, so much so that the prospector ranked himself as above the status of the miner, and took more or less pride in the distinction. This professional feeling continued, and still persists, although at the present time some of the craft are too lazy to be efficient explorers. In the beginning, however, the occupation was chosen and followed by men of real pioneering ability, although sometimes very illiterate, and in all parts of the western mining districts of the United States, and in Alaska, there still remain numerous vigorous, honest, and capable individuals of the class.

Outside of the United States and Alaska the prospector, as so understood, does not exist. This statement can be made without reservation. The occupation is unknown in Latin America and in South Africa. There were hundreds of them at one time in British Columbia, but they have disappeared from that richly mineralized section of Canada. In the Yukon country they were present in large numbers when the Klondyke district was thought to be a part of Alaska, but they left when that famous region proved to be British territory. In all the remaining parts of Canada the prospector is notable by his absence. The business has never been heard of in Siberia. In Australia, Tasmania, and New Zealand, although many were in the field in the early days, none can be found now.

The further statement can also be made with confidence that prospectors exist only in those parts of the United States that are under the provisions of the Federal mining law. For instance, though numerous in New Mexico, they cannot be found in the adjoining State of Texas, although the latter is known to possess great mineral resources. There are none in the Lake Superior copper and iron mining regions, nor in the zinc and lead fields of the Mississippi valley.

The natural inference from these statements, if they cannot be controverted, is that the prospector is the child and product of the Federal mining law. If he is a desirable one it will be well worth while to ascertain what there is in that law that has produced him, and keeps him after nearly 70 years of activity, still

a figure of importance and value. Can discovery proceed without his services?

To a very limited extent discovery is in progress in British Australasia, but is practically at a standstill. In Latin America and Canada identical conditions exist. We hear of little from all these regions except the continued working of mines discovered 30 to 50 years ago, or the reopening of "antiguas." In the case of Canada a few new and important mineral districts have been found during recent years, but investigation reveals the fact that all of them were purely accidental strikes, made either by railroad graders in the course of their day's labor (Sudbury and Cobalt), or by sportsmen when in the pursuit of game (Porcupine). Practically nothing new has been found in British Columbia since its law was changed in 1897. In Texas, though the State is offering liberal bounties for new discoveries, none are reported. Prospectors by the thousands are swarming all over Alaska, in spite of its severe climate, while across the line in the Yukon Territory of Canada no exploration is in progress. In fine, a careful examination of international conditions in the business of metal mining shows that in the matter of new discoveries the western United States and Alaska are the only parts of the world where advance has been steady and important from the first and still continues to be. Evidently therefore the American prospector is an asset of some importance and value to the nation.

What then does the prospector require as an inducement to carry on his peculiar line of activity with energy? First he appears to demand freedom in its exercise. He carefully avoids all lands where a license is required, and those where the processes of initiating and maintaining a title are complicated and expensive, and where no fee simple title is obtainable. But above all other circumstances that which seems to be most necessary to retain his services is the ability to locate a claim which has a selling value as a prospect, and which does not have to be developed to attain that quality. For he is not a developer. He is purely an explorer and finder, and cannot make a living in his

profession unless he can dispose of his find on the basis of the nature of the claim he can record and maintain upon it. Such a nature seems to have been unconsciously conferred by the American Federal mining law when the doctrine of the apex and of extralateral rights for lode claims was incorporated in it when it was framed by the miners themselves. For this doctrine makes the vein or deposit the legal entity granted, while the surface tract is regarded merely as an appendage thereto, and gives the former to its discoverer in its entirety no matter where it may lead him. With this right assured it is not possible to locate along his side line and cut him off on the dip, nor is he compelled to go to the expense of locating a number of claims alongside of each other to protect himself. Hence, when he has found something of value he can command a fair price for it, for his title covers whatever there may be of it within his end lines and within the limits of practical mining operations.

There are some who hold that the price paid for his services in the form of vexatious litigation due to the unbusinesslike habits and careless way of the average individual of the class is out of all proportion to the results realized from his undeniable pioneering ability. This view does not seem to be warranted by the facts in the case. Nor does it appear at all likely that the future will bring any recurrence of the turbulent days of old. For the modern American prospector, while retaining the most of his desirable characteristics, is not only a peaceful but a comparatively well educated individual, fairly posted in the requirements of the mining law as now interpreted by the courts, much more careful than his predecessors in carrying out their provisions, and generally a respected member of the community in which he operates. This change is well displayed by the comparative quiet that reigns in Alaska, where at present his activities are most in evidence.

There are others who assert that the apex and extralateral rights doctrine is inherently a fallacy, and never can be made to square with those basic and settled principles of jurisprudence that have to do with the matter of real estate titles. This may be so, but if it is, it is not the only fact or condition in the life of

today that is at variance with the foundations upon which the structure of modern law has been so painfully erected. It must be recognized that the mining industry is a very new line of human activity, and is still in a formative state. We know comparatively little about the crust of the earth. Yet added knowledge of its contents is clearly desirable from every point of view. How absurd therefore to impose the handicap and stigma of a license on the activity of those comparatively few individuals whose curiosity and optimism incline them to attempt to explore underground in ways and by acts which have come to be regarded as unwarranted if practised by other surface owners. If his methods are repugnant to the principles of the law, then perhaps it may be better for the general good that the law should change its aspect and point of view in this matter, than that the prospector should be compelled to abandon his useful, if at times most inconvenient, activity.

CHAPTER XIV

Extralateral Rights

Before considering the doctrine of extralateral rights in lode mining property on its merits, it will be both interesting and advantageous to study its history. For it is a doctrine of considerable respectability, if the matter of age alone confers that quality. It did not originate in the United States, as some have supposed. It was in operation as a well recognized and just principle in mining practice when Agricola published his famous work on mining in 1530, and apparently had been so for many centuries before that date. It was applied however, in those days, and in the German mining districts, only to that class of mineral deposits described by that writer as a "vena profunda," by which he meant a lode that had a well defined and continuous dip of importance into the earth; in short, what we now call—perhaps rather vaguely—a fissure vein. In all other classes of mineral deposits beneath the surface, which were summarized by him under the two names of "vena dilatata" and "vena cumulata," the miner was strictly confined in his operations within vertical planes extending downward from his surface boundaries. Whether the doctrine originated in Central Europe, where mining had been in progress ever since the beginning of the 7th century of our era, and probably for several hundred years prior to that date, or was an inheritance from Roman times, it is impossible to say. But because it is also found in a somewhat different form in the old Spanish mining laws, which certainly came down from Rome, it seems probable that its root was in the laws of that empire.

In Agricola's time, and among the German miners, the claim unit was called a "meer," and consisted of a piece of land seven

fathoms square, the fathom being six feet. To the discoverer of a new vein seven of these units, laid out in a string along the outcroppings, were allotted, as a reward. Thus his claim was a rectangle 42 feet wide and 294 feet long, and his right to possession depended on continuous working by himself or a man in his place (except a total of 68 days throughout the year) and the payment of one-tenth of his product of ore to the Overlord. As to his underground rights I can perhaps do no better than to quote Agricola's words verbatim, as given in the excellent translation by Hoover.

"Of the width of every meer, whether old or new, one-half lies on the foot wall side of the "vena profunda," and one-half on the hanging wall side. If the vein descends vertically into the earth, the boundaries similarly descend vertically, but if the vein inclines the boundaries likewise will be inclined. The owner always holds the mining right for the width of his meer, however far the vein descends into the depths of the earth."

Thus it will be seen that the practice in central Europe differed from the American doctrine in that it gave the miner 21 feet of vein and of country rock on both sides of the center of his vein at all points in its depths, whereas the American law confines the miner strictly within the limits of his vein walls after it passes beyond the vertical plane of his side line.

In another detail also the two doctrines diverge, and as some hold that the American system was copied from the German, it will be interesting to note this difference. With us the claim-holder has the exclusive right in depth to all veins the top or apex of which lie within his surface lines. But in the German law the extralateral right of pursuit was given only to such of them as, outcropping within his surface lines, might be found in due time to unite with the vein upon which the original discovery was made, and which alone was presumed to be given to its discoverer.

It does not appear from Agricola's writings that the doctrine produced much litigation. Probably this was due to the fact

that all the mining operations of his day were conducted under rules and regulations prescribed by the local Overlord or his chief functionary for the industry, who was known by the title of Bergmeister. The powers of this official appear to have been very great, and his rulings almost final. It is likely that he settled boundary and underground disputes very summarily, and that the miners, being much in his power, and possessing little right of appeal to any higher tribunal, would perforce arrange most of their difference among themselves.

In some manner the extralateral doctrine made its way to England, but to one part of it only, so far as I can ascertain. It does not appear to have been current in Cornwall, probably because the mines there had all been discovered centuries before mining became an organized industry, and had passed into the possession of landed proprietors, who leased them on such terms as they saw fit, and often without much consideration of any rights superior to their own. In Great Britain the State, at a very early date, abandoned to the surface owner all underground rights, except as to gold and silver, which are still held to be "royal" metals.

In a book entitled "The liberties and customs of lead miners within the Wapentake of Wirksworth" written by one Edward Manlove, and published in 1653, we learn that in a certain part (and perhaps all) of the Derbyshire lead-mining district, the miner had the right "to follow his vein in depth (within his end lines) wherever it led him." As the operations there at that time were conducted under the supervision of an official known as a "Barman" (evidently an anglicised version of Bergmeister) it seems probable that the district was discovered by German miners, or else organized under their advice, and on the basis of customs with which they were familiar in their own country.

In Spain the doctrine appears to have been current in very ancient times, and at some period of mediæval history to have been abrogated, and again later revived for the purpose of curing an evident injustice to the miner resulting from the doctrine

of vertical boundaries which had displaced it. For, under Title VII of the mining ordinances promulgated on May 22nd, 1783, we read as follows:

"Experience having shown that the equality of the mine dimensions established on the surface cannot be maintained underground, where in fact the mines are chiefly valuable, it being certain that the greater or less inclination of the vein with respect to the plane of the horizon must render the respective properties in the mines greater or smaller, so that the true and effective impartiality, which it has been desired to show to all subjects of equal merit, has not been preserved; but on the contrary, it has often happened that when a miner after much expense and labor, begins at last to reach an abundance of rich ore, he is obliged to turn back, as having entered on the property of another, which latter may have denounced the neighboring mine, and thus stationed himself with more art than industry. This being one of the greatest and most frequent causes of litigations and dissensions among miners, and considering that the limits established for the mines of these kingdoms, and by which those of New Spain have been hitherto regulated, are very confined in proportion to the abundance, multitude, and richness of the metallic veins which it has pleased the Creator of his great bounty to bestow on those regions; I order and command that in the mines where new veins, or veins unconnected with each other, shall be discovered, the following dimensions shall in future be observed.

"*Sec.* 2.—On the course and direction of the vein, whether of gold, silver, or other metal, I grant to every miner, without any distinction in favor of the discoverer, whose reward has been already specified, 200 varas (approximately 600 ft. taken on a level, as hitherto understood.

"*Sec.* 3.—To make it what they call a square, that is, making a right angle with the preceding measure, supposing the descent or inclination of the vein to be sufficiently shown by the opening or shaft of ten yards, the width shall be governed by the following rule:

"*Sec.* 4.—Where the vein is perpendicular to the horizon (a case which seldom occurs) a hundred level yards shall be measured on either side of the vein, or divided on both sides, as the miner may prefer.

"*Sec.* 5.—But when the vein is inclined, which is the most usual case, its greater or less degree of inclination shall be attended to in the following manner.

"*Sec.* 6.—If to one yard perpendicular the inclination be from three

fingers to two palms, the same hundred yards shall be allowed for the width, as in the case of the vein being perpendicular.

"*Sec.* 7.—If to the said perpendicular yard there be an inclination of two palms and three fingers, the width shall be of 112½ yards; two palms and six fingers, 125 yards; two palms and nine fingers, 137½ yards; three palms, 150 yards; three palms and three fingers, 162½ yards; three palms and six fingers, 175 yards; three palms and nine fingers, 187½ yards; four palms, 200 yards. So that if to one perpendicular yard there correspond an inclination of four palms, which are equal to a yard, the miner shall be allowed 200 yards of width on the declivity of the vein, and so on with the rest.

"*Sec.* 8.—And supposing that in the prescribed manner any miner should reach the perpendicular depth of 200 yards without exceeding the limits of his portion, by which he may commonly have much exhausted the vein, and that those veins which have greater inclination than yard for yard, that is to say, of 45 degrees, are either barren or of little extent, it is my sovereign will that, although the declivity may be greater than the above mentioned measures, no one shall exceed the square of 200 yards, so that the same shall be always the breadth of the vein extended over the length of the other 200, as declared above.

"*Sec.* 9.—However, if any mine owner, suspecting a vein to run in a contrary direction to his own (which rarely happens), should chose to have some part of his square in a direction opposite to that of his principal vein, it may be granted to him, provided there shall be no injury or prejudice to a third person thereby."

From this last section it is evident that in Spain the extralateral right included all veins the apexes of which lay within the surface boundaries, and not only the principal vein, as was the case with the German law. Aside from this, however, here we have the doctrine approved as a natural right, but to a limited extent only, and made dependent (as to limit) upon a determination of the dip of the vein as shown in the excavations made by the discoverer before marking out and recording his claim. As the excavation required was a shaft ten yards deep on the lode, not enough, according to our modern views for a correct determination of the true average dip, disputes between neighbors were inevitable, and frequently occurred. Some of these

are touched upon very interestingly in Sec. 14, which reads as follows:

"As it has been found that the license or permission of following a vein by working lower down, and within the vein, and having enjoyment thereof, until the owner himself has connected it with his own workings, is the most fruitful cause of bitter dissensions, litigations, and disturbances among the mine owners; and further considering that such intrusion is more generally the result of fraud or chance than of the merit and industry of the person so intruding, and that the consequences thereof occasion, for the most part, nothing but serious detriment to, or the total ruin of, the two mines, and the two neighboring miners, to the great prejudice of the public, and of my royal treasury; I order and command that no mine owner shall enter the property of another, even though merely by continuing his own vein at a greater depth, but that every one shall keep and observe his own boundaries, unless he makes an agreement and stipulation with his neighbor, to be permitted to work in his property."

As the Iberian peninsula has been the most productive region of Europe in metalliferous minerals ever since the days when the Carthaginians possessed it, and still holds primacy in this respect, it seems more than probable that the doctrine of equilateral rights existed there in the days when Spain was a new land, like the western United States in 1849, its terrain freely open to the prospector of the day, who perchance made his own laws, as did those of California, basing them on the fundamental theory that to the discoverer belonged—as of right—the thing he discovered, to wit, the vein, no matter where it led him. We may also perhaps hazard the guess that, as the country filled up with surface proprietors engaged in agriculture and stock raising, this right was gradually taken away from him; and, finally, that in the decree just quoted, that good natured and wise potentate, Albouss XI, desiring to encourage the industry of mining, which was beginning to languish for lack of new discoveries and because of the rush of miners to the newer and supposedly richer fields of New Spain, by making it more to their interest to search for undiscovered lodes; and yet, being unable or unwilling to com-

pletely upset the doctrine of land tenure that had gradually come to be regarded as fundamentally proper by surface owners, hit upon this limited procedure as a compromise between the two theories. If so, it was of the nature of a partial restoration of former acknowledged rights.

In considering the doctrine on its merits, its antiquity is the first element that deserves attention. It is to be remembered that everywhere in the world the mining industry began either with discoveries resulting from the conscious and intelligent efforts of laboring men, or by accident. There are no records of mines found by scientists or professional men of any kind. Hence it is not difficult to believe that the doctrine originated among the actual discoverers of lodes and veins. It is, on its face, a development of primitive times, of regions free from landlords, and it gives expression to the idea that underground property should be regarded somewhat differently from that on the surface. Naturally the primitive miner knew little of the ways of veins and lodes of any kind, but the so-called fissure vein, when at its best, is a most regular and interesting specimen of nature's handiwork, and doubtless was considered as the normal manner in which metal-bearing ores should be found. We know more about such matters today, and yet no one has been able so far among the constructors of mining laws to formulate a substitute for the extralateral rights doctrine that will accomplish for the industry what it has already done.

That such an unusual conception should involve difficulties hard to solve detracts nothing from its real merit. It is most positively advantageous to a community that any mineral wealth existing within its boundaries should be discovered, and while the mineralized lands still remain as public domain. The steps leading up to such results are laborious, and will only be undertaken by the laboring man. He is the one individual who will go out into the wilds and undergo the discomforts and hardships inevitably connected with exploratory work. Such people rarely have money to maintain themselves while sinking shafts or driving levels, and they will not and cannot engage in the occu-

pation of prospecting unless the community agrees upon a custom or law which gives them a proper reward for their efforts. This the extralateral doctrine does, when coupled with other provisions enabling discoverers to hold their finds until a buyer, or a partner with means is secured. A mere surface plot of an agreed area, even though liberal in its size, does not answer the need. But the right to follow the ore indefinitely does, because it is a lure to the man who has money and is inclined to risk it in development work. That this is true is amply demonstrated by a consideration of the history of mining districts in any part of the world. In modern communities, where unexplored mineral areas exist, and where the doctrine of extralateral rights is not in force, discovery, except by accident, does not take place. Witness the conditions throughout all of Latin America, of British Australasia, and British North America, in old Europe, Asia, and the settled parts of Africa. Nothing new is being found except by pure accident. All the metal coming into the markets of the world from Mexico, and from Central and South America, is being taken from deposits originally discovered by the pioneers of those lands. The same is true of the gold mines of the Transvaal, which did not attract the attention of capital until the outcrops of the reefs had been traced and worked in the crudest way for several years. Even then, after a careful examination by one of the most capable and widely known mining engineers of the day, the proposition was turned down, and it remained for an optimistic promotor without technical knowledge to demonstrate their value.

It is perhaps necessary to admit that the doctrine cannot be defended except on the theory that it is of the nature of an inducement to search. The experiences in the old German mining camps, in western United States, and in British Columbia before its mining law was changed, show that it did produce discoveries, and continues to do so where retained. The experience in Rhodesia yields no conclusions, for that field was already very thoroughly prospected before the white man took possession. On the other hand, the experience in Spain, where the doctrine

was in force on a limited scale for a time, and had practically no effect, shows that half-way measures do not succeed. This is confirmed by the results obtained in those modern mining regions, where extra wide, or large square, locations, without extralateral rights, have been on trial as a substitute, and have failed to attract the prospector.

CHAPTER XV

Discovery of Ore as a Prerequisite to a Valid Location

Of the modern mining laws 37 require a discovery of mineral before a valid location can be made, and eight do not. In not one of them is to be found a reason for or against the requirement, and there is not always uniformity on the subject within the groups of laws. Thus, the laws of all Canada except New Brunswick, of British Australasia except Tasmania, of the South African group without exception, and of all Latin American countries except Mexico, Brazil, Peru, and Venezuela, require discovery, and many of the last group demand in addition that a sample of the mineral found be deposited with the authorities when the application for ground is made. British and French Guiana laws insist upon discovery as a prerequisite to location, while Dutch Guiana, situated between the two, and on the same mineral field, does not. In America the Federal law inferentially requires it, but in practice no proof of the fact is demanded unless non-discovery is alleged by a third party. Nothing is said on the subject in the Texas law.

The insistence of discovery before staking is one of the most ancient doctrines of mining jurisprudence. In the old Spanish and German codes no vein location could be made until ore was clearly displayed between well-defined walls of country rock, and this rule persists in Spain and Portugal, and in many of the Latin American republics, but has been wholly eliminated in Mexico which, so far as the mineral industry is concerned, is the most advanced of its group.

Since the invention of the percussion and core drill, permitting exploration in depth, discovery by this method has generally come to be considered as valid, and the drift of opinion among mining

operators has for some time been towards the elimination of surface discovery as a necessary basis for the initiation of a mining title, while a very respectable number go so far as to advocate the Mexican doctrine of requiring no discovery at all. It is now well recognized that many ore bodies have no surface outcrop. The position of some of these (predicated for geological reasons) may be determinable by the drill, while for others shafts and levels therefrom, or tunnels, or both, are necessary. It is therefore very reasonably argued that if an unoccupied or unused tract is desired for underground exploration purposes by anyone willing and able to push the same vigorously, the right to do so should be given, regardless of whether there are any indications of mineral values on the surface or not.

On the other hand it is not to be forgotten that the extralateral rights doctrine depends entirely on the existence of an apex, not necessarily on the surface, but yet within vertical planes passing through boundary lines; and that this doctrine, though considered by many students of the subject as undesirable and even dangerous, is yet worthy of very careful consideration by broad thinkers, if for no other reason than because of the very successful and profitable industries that have developed under its provisions in each of the two notable mining regions where it is in force (United States and Rhodesia). Collaterally, the Mexican law, which gives no extralateral rights, calls for no discovery, and confers perpetual possession and usage on the sole condition of the payment of an annual ground rental should also be considered. Under its provisions a splendid industry has also arisen, and in the opinion of many mining engineers and operators its law is altogether the best in existence.

But a study of the two iindustres that have grown up under these opposing and contrasting systems, and side by side in the case of Mexico and the western states of America, reveals some effects that should be noted. To reduce the field under investigation to narrower limits, let us compare conditions in the American states of Arizona and New Mexico with those in the adjoining states of Sonora and Chihuahua in Mexico. In both the

main industry is mining. Topographically, climatologically, and geologically the four cover practically one region. If there is any considerable difference in their mineral potentialities the balance is probably in favor of the Mexican half. Their areas are nearly equal. Historically the southern half is the older, and has been a mineral producing district the longer time. Yet the industry there has produced severe and continuous poverty for the great masses of the people, while across the line to the north it has resulted in widely distributed prosperity. Considerable allowance no doubt should be made on account of the racial differences between the two populations, but this will not account for the fact that while on the American side of the international line the most of the mines have been and are now owned by resident citizens of moderate and even small means, in the Mexican states the ownership has always been among a very few, and is now very largely concentrated in the hands of close corporations the most of whose stockholders are foreigners. Again, in the former, prospecting is active and new discoveries almost a continuous performance, while in the latter exactly contrary conditions in this respect prevail, though for the last half century or more exploration in Mexican mineral districts has been as freely open to aliens as to citizens.

In requiring the discovery of mineral as a prerequisite to a valid location, the framers of the American law (as is well known historically) considered that he who found the outcrop of a new mine was entitled to its ownership, and should not be confined in its development and operation underground within narrow surface limits. They also held the complimentary view to the effect that he who could not produce an outcrop on the claim he had staked off should not be allowed the possession of it, if someone more energetic, more intelligent, or even more lucky did find ore.

To recapitulate: If promising mineral ground can be withdrawn from the public domain and passed into private hands simply at the cost of staking and recording, plus a nominal annual acreage rental, and even plus an annual development expendi-

ture, without regard to surface indications or conditions, then the man with money to invest in land and its development has a decided advantage over the man with no capital but his labor, in the normal struggle between the two for possession of the earth. As against this it may be said that the capitalist has a right to such an advantage, and to deny him that right is—to such an extent—to discourage investment in underground exploration. Per contra it can be urged that the curtailment under consideration has to do only with the quantity of land withdrawn without apprent cause, and should not affect development; or, to put the matter another way, that some limit should be placed to the area locatable without discovery, or, in lieu thereof, a higher annual rental or assessment requirement be demanded. It is generally recognized in all the existing mining laws that he who explores for low-value substances (coal, oil, gas, etc.) requires a larger field in which to operate if he is to have a fair run for his money, than one who searches for minerals of high commercial value, like one of the metals. Here the heart of the question is reached. The earth's available mineralized surface is of limited extent. The demand for a portion of it is steadily increasing with the advance of knowledge. Is it more conducive to the general good that its possession should be distributed among the many, or among the few? Experience in other classes of real estate indicates clearly that the first alternative produces more general prosperity than the second. It would seem, then, to follow logically that the right to the possession and usage of mineral land should be founded upon something more than the ability to pay normal taxes upon it.

CHAPTER XVI

Leasehold vs. Fee Simple Title

The long-term leasehold system for the tenure of mining property, which is in effect in British Columbia, Nova Scotia, the Gold Coast and Ashanti, Egypt, and all the British Australasian states, either alone or in combination with the annual leasehold plan as a preliminary step, provides ample security for capital when the period is sufficiently long or when it carries reasonable renewal privileges, and when the annual rental required is a matter of not over 4% or 5% upon fair valuation. These conditions are complied with in the case of most of the above-mentioned States. The system has the added advantage of allowing the government not only to insist upon terms tending to secure the health and safety of employees, but to enforce the same with comparative ease; also, with great facility to collect periodically the statistics of the industry.

The annual leasehold system, renewable indefinitely, on payment of the annual tax, which is current in all the Latin-American countries, in British Australasia, Rhodesia, and several of the Canadian provinces, appears to work well, as far as it goes, especially where the laws provide for conversion at any time at the option of the claimant into long-term leases. Temporary protection is given to holders of small means at moderate cost, which is yet sufficient to cover the expenses of governmental administration, and to provide the time in which to decide, through preliminary development, whether or not the property can be made profitable, and to find a buyer or a partner if the cost of doing so is beyond the financial ability of the claimant.

The monthly leasehold plan, which is confined exclusively to the four states of the Union of South Africa, is a refinement of

the system which perhaps has not been long enough in operation to be fairly criticisable. On the face of it such a term should not be satisfactory to capital, yet under its provisions the immense gold industry of the Transvaal has been established and is being operated. In that state, and in the adjoining one of Orangia, the holder pays for his possessory title at the rate of about $40 per acre per year, a ground rental which the average claim on the Witwatersrand reefs will perhaps stand so long as native labor is available, though it is a rather heavy tax. For one of the American size (a little over 20 acres) it would amount to over $800 per annum, corresponding to 5% on a valuation of $16,000. This is far above the actual prospective worth of the vast majority of precious metal claims during their development period, and perhaps will explain why, in the two states mentioned, there is so little claim locating outside of the areas already proved to be mineralized. On the other hand, in Natal and the Cape Province, for an equal area, the annual tax is only $60 and $42 per year respectively, the low rate probably having been made to encourage discovery.

The theory of the leasehold system for mining property, as contrasted with the fee simple system for all other forms of real estate, rests upon the evident fact that mines are properties which are steadily decreasing in potential income-producing ability as the extraction of ore proceeds, in consequence of which the time comes for all, either because of the exhaustion of the ore, or the inevitable increase of expenses in depth, when operations must cease. For these reasons it is held that when mines are abandoned, possession should return to the community, so that the surface may be used for any other purpose for which it is suitable.

The case for the fee simple title rests mainly on two arguments. The first, and by far the most important of these, is that the feeling of pride in absolute ownership of land is a sentiment which it is most desirable to cultivate and encourage, because it tends towards the growth and maintenance of individuality and independence, and in its effects upon a people is worth

all it may cost and more. The second is that an exhausted patented mine will inevitably return to the community in due time through the failure on the part of the owner to pay taxes.

It will be interesting to note that in British Columbia, Ontario, Quebec, and Newfoundland the laws give the miner the option of a leasehold or crown grant. In the same connection it will be well to remember that the American Federal law accords to the possessory (unpatented) mining claim the exact legal status of a perpetual annual leasehold, so far as the government is concerned, and to the extent that its claimant is able to sustain his right in the courts as against his fellow citizens.

The argument advanced by some opponents of the fee simple title, to the effect that it has a tendency to lock up a vast amount of ground in the hands of owners who are either unwilling or unable to develop, does not appear to be sustained by the facts, as the author has found them. On the contrary, the condition seems to be that owners of idle patented mining ground are generally eager to sell or lease if the opportunity to do either is offered. The case does not seem to be parallel in any way to that of the holder of unimproved lots in a growing city. But, assuming that the argument is sound, correction may easily be effected by a provision like that in force in the Canadian Province of Quebec, where the holder of a crown grant on a mining claim is still liable for annual assessment work; or by laws such as those in effect in several of the American States (notably Nevada) where a special acreage tax is levied on all idle patented claims.

As an industry develops the laws under which it has grown up are constantly in need of revision or amendment. This is inevitable. The problem is to correct wisely, and after proper consideration of the effect in other parts of the world where regulations similar to those proposed have been in force. Any legislation that discourages personal ownership in land, and substitutes for it government or community ownership, would seem to be a step backward instead of forward, even from the point of view of the intelligent socialist.

CHAPTER XVII

Free Prospecting vs. Licensed Prospecting

Following are the localities where free prospecting is permitted by the mining law in force:

The western American States and Alaska.
Texas.
Manitoba.
Saskatchewan.
Alberta.
The Northwest Territory.
The Yukon Territory.
Mexico.
All the Central American States.
All the South American republics except Brazil and Argentina.
Cuba.

The list of countries where a prospecting license is required is as follows:

British Columbia.
Ontario.
Quebec.
Nova Scotia.
New Brunswick.
Newfoundland.
Brazil.
Argentina.
Haiti.
British, Dutch, and French Guiana.
Egypt.
All the British Australasian States.
All the British South African States.

Rhodesia, Japan and all British Protectorates.

The arguments for these two principles in mining law may be marshalled as follows:

For Free Prospecting.—The real prospector is almost invariably a man of small means; and cannot afford the cost of a license; and when the document—as is often the case—confers the right to locate one claim only, the necessity of providing himself with several of them upon starting out on a prospecting trip, during which he anticipates making more than one location, is a burden which, in many cases, deters him from the enterprise altogether.

The advantages accruing to a state through the discovery of such mineral resources as may exist on its public domain, before such areas pass under private ownership, are so great and so manifest that every obstacle in the way of the unrestricted privilege of search thereon should be removed. Equally great and apparent are the benefits to a community resulting from mineral discoveries made on alienated land before it is employed for uses which might forever bar search, or add materially to its difficulty, or make necessary the payment of heavy indemnities for possible or actual damages during exploration.

There seems to be no inherent reason for subjecting such an occupation as prospecting to license. The prospector, to the extent that he is successful, adds to the resources of the country in which he operates, and his failures detract nothing from its wealth. In no way is his work dependent on or destructive of the advantages and facilities created by modern society.

For License.—The cost of the license is so small as to be negligible in the majority of cases.

It is most desirable for the authorities to be able to keep track of the prospector and of his activities, and this is possible only if he is under license. It is an advantage to be able to know at all times how many of the fraternity are in the field, where the majority of them are exploring, and what progress is being made at any given time or place. It is not conductive to orderly growth and progress in the business of exploration to have it

in the hands of wholly unknown and irresponsible parties, or to have the country dotted with claims the status of which it is difficult to ascertain.

Most of the mining laws of modern origin (enacted, say, during the last 30 years) afford internal evidence of having been framed by lawyers, and without much—if any—collaboration of men who have had personal experience in the business of mining. The result in those cases has been a lack of proper consideration of that department of the industry which has to do with the matter of discovery, and over emphasis of that relating to development and operation, the one being neglected and the other hampered with unnecessary form and ceremony. In particular, the business of discovery, the steps that lead up to it, and the conditions under which it occurs, have been extensively misunderstood. The prospector has been regarded as an individual of more or less means, of more or less scientific knowledge and training, and as one who at slight personal expense or discomfort goes forth into the unoccupied parts of the land and siezes a part of it without giving much value to the community in return. The occupation thus comes to be considered as a privilege, of much the same nature as that of the hunter and fisherman, and for which it is no more than right to exact a license. This view is the only one that will explain the very heavy penalties imposed in a number of the most modern mining acts on individuals found exploring for mines without due permission from the authorities. That the conception is totally erroneous is easily capable of demonstration. Nothing proves it more conclusively than the frantic governmental offers of rewards for new discoveries in those lands from which, by license demands, the pioneering class have been driven away or compelled to adopt other means of gaining a livelihood. The real fact is that the individual of an exploring proclivity is one of the most valuable assets a new country can possess. Instead of asking him to pay for the right to exercise his peculiar faculty, we should encourage him in every reasonable way to give it full play. If we are misled by his frequent disregard for the conventionalities

in language, dress, and personal habits, we might as well complain of the same in the farmer and the laboring man of all classes.

Furthermore, his services cannot be bought in the ordinary way. All efforts to stimulate discovery by cash or other kinds of rewards have everywhere failed. The man of true prospecting spirit is too erratic and too improvident (some might say too artistic) to work for hire. He wants only what he can find. He should be welcomed in every mineral region with a brass band, and given the freedom of its limits.

CHAPTER XVIII

Prospecting Areas

These are obtainable in a large number of mining countries. The theory upon which they are based is that if an individual or company with means wishes to conduct exploring operations upon a large and scientific scale, to locate suspected mineral of which there are no direct indications on the surface, or to open up a deposit already discovered but neglected, with the view of ascertaining if it can be made payable, the opportunity to do so should be encouraged by the temporary exclusive grant of a good sized tract of land, with the right, within a reasonable time, of selecting a smaller tract from within it for permanent operations.

There would seem to be no reasonable objections to the plan in cases where there are no certain indications on the surface of mineral values below, or where the ground had already been looked over by the individual prospector and recognized as too unpromising for his method of operation. Coal, oil, gas, and many other desirable mineral substances may often be inferred with great certainty, for geological reasons, under areas completely free from all surface indications of them, and wholly beyond the reach of the pioneer mineral explorer. The same is occasionally true in cases of metalliferous deposits. Many instances also are known where outcropping veins and segregations, too low in value or too scattered in disposition to attract the prospector or induce preliminary exploration by him, have been successfully developed into mines of great value by means of well directed capital.

But experience in those countries where such areas are obtainable shows that unless much care is exercised in granting them

unfortunate results may easily follow. Unless the grant is clearly recognized as a privilege which should be liberally paid for by the recipient, the individual explorer who has not the means to take advantage of it is liable to be discouraged in his line of activity, particularly if the area reserved from his investigation is large, or has not previously been accessible to him. Of course, in lands where the prospector has never existed this objection has no force, but where free prospecting is allowed it has much weight. It cannot be too strongly emphasized that everywhere, either at the beginning of the mining industry, or at some time later when new discoveries are needed to keep it alive, the pioneer explorer is an absolute necessity, and should be given his opportunity before much ground is locked up in State, National, or private reserves of any kind.

In countries where prospecting licenses are required, and where the business of mining is suffering because of the lack of new discoveries, instead of trying to stimulate exploration by rewards of money, or of large claims, or other special privileges, all of which devices have so far proved futile, it would be an interesting experiment to throw open for a year or longer a tract of the public domain of good size as an absolutely free public prospecting area, under conditions and rules that would give the explorers such right to acquire property as has proved successful in attracting their services elsewhere. If, for instance, such tracts were widely advertised as to be thrown open for one or more years, it seems probable that prospectors would pour into them and give them such a preliminary surface examination as could be secured in no other way. That is the kind of prospecting area that would be of the largest public benefit, because it would probably result in a number of discoveries, several of which might later become the foundations of extended development by capital. A prospecting area for the prospector himself would be simply a return to the condition of the "early days" in every part of the world where notable mineral discoveries have been made.

CHAPTER XIX

Defects and Deficiencies of the American Law

In the opinion of the author the two most important deficiencies of the American law are, first, that it applies only to a part of the Union and, second, that it makes provisions for the discovery and operation of mines on only the unoccupied public domain of the nation.

The first could probably be cured without much difficulty except in the case of the State of Texas, but as it now stands it would have small application east of the Mississippi Valley where but little public land still remains.

To make its provisions apply on privately owned and State lands will call for a reconsideration of our whole doctrine of land tenure. What can be and has been accomplished in autocratic European countries as well as in some of those under liberal parliamentary rule along this line, will be effected with considerable difficulty in a pure democracy. Yet the time must come when the nation, having regard for the probably enormous undiscovered metallic wealth in the older states of the Union, will have to face the question and solve it. The experience in the British Isles, from which country we have inherited our ideas of the nature of real property, and where all attempts to bring about modifications of the doctrine held have so far failed, in spite of the fact that everywhere else in Europe changes have been effected, is an indication of how difficult it will be for us to alter our views even now.

Meantime it should not be so hard to take steps towards that end in those states where the Federal law now applies, and it is full time to move in that direction. Already vast areas in the far West have passed out of the control of the people in the form

of grants to railroad corporations, ostensibly of land suitable only for surface occupation and usage in agriculture, grazing, forestry, etc., and also granted with a special reservation of all mineral rights except those of coal and iron; but which the grantees or their assigns are now holding under the same theory by which real estate is held in the older parts of the country, namely, that ownership of the surface carries with it ownership of everything vertically underneath it.

It will be impossible to discuss here the legal aspects of this question, but simply to call attention to the fact that in all parts of the civilized world except in the British Isles and in the United States this doctrine has been virtually abandoned, and in its place has been substituted the theory that the unexplored subsoil, being "res nullus" belongs either to the national sovereign in the case of autocracies, or to the Nation in countries under parliamentary governments. This will be made clear by examining the digests in this volume. Further it will be interesting to note that everywhere, except in the United States and four of the Canadian provinces, the sovereign or the nation as represented in its legislature, refuses to give fee simple title to the underground. Instead, the right of possession and usage is offered under some form of lease, either for a month, a year, or a term of years, or in perpetuity, in all cases dependent on some form of monthly or annual rental, default in the payment of which automatically causes forfeiture of the right.

In the matter of placer claims new legislation is much needed. As the law now stands, if no veins or other forms of mineral deposits in rock in place have been discovered within its lines by the time a patent is granted, the deed from the government passes fee simple title to all that may hereafter be found. This is obviously an unwise provision, having the effect of withdrawing the ground from under-surface exploration except by its owner, while the grantee acquires more than the locator asked for or expected to get. The Land Office should be authorized in such cases to issue a patent in which undersoil minerals are expressly reserved. On the other hand, when that form of claim is used

to acquire beds of coal, pools of oil, reservoirs of gas, or deposits of other substances supposed to exist because of surrounding geological conditions, the fee simple title to the same should ultimately pass to the individual or corporation that had the energy and enterprise to explore and discover. The author is not in favor of substituting leases in such cases, no matter how favorable their terms might be. It is true that this is the solution of the problem adopted almost everywhere else in such cases, but that does not necessarily prove it to be the best one. The general effects of leasehold titles on the individual and the community should be taken into consideration. This has been pointed out in Chapter XVI, and nothing further need be said here on the point.

Many of the most glaring deficiencies of the American law have been corrected by the various State laws, and some of the difficult situations that have arisen under the doctrine of the apex have been overcome by the consent of the community where they originated to ignore the letter of the law. This is one of the most interesting developments in the evolution of democracy, and has a generally true bearing on the science of jurisprudence. Just as, in the matter of frauds, it is impossible to enumerate all that may be invented or attempted, hence making it very difficult to exactly define the nature of the offense, or prescribe adequately in advance the punishment that should always follow; so, in the case of laws framed to govern operations upon the infinitely varying forms in which ore deposits have been disposed by Nature in the crust of the globe, there will be found, from time to time, conditions that have not been contemplated in the law, no matter what its class may be, and that are beyond its powers to solve with perfect justice. Because this must inevitably be so, it does not follow that a doctrine conferring equity in the vast majority of cases should be set aside because it fails completely in a small number of them, and then must be decided by the commonsense of the people acting outside of the letter of the law.

The costs connected with the process of patenting mining

claims are larger than they should be. This is mainly due to the fact that the procedure that has been prescribed is so unnecessarily complicated and antiquated that the services of a lawyer are generally required. This defect can be cured without legislation. The preparation of patent papers should be placed in the hands of the local land office officials, and no charge made for the work. Advertising and surveying costs should be reduced, also the price of the land, and payment for the same by installments should be made possible.

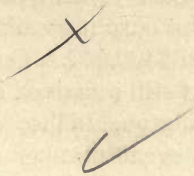
There is need of legislation in connection with tunnel rights. There is nothing in the law providing for their reversion to the public domain after abandonment. Many enterprises of this kind, started for drainage, transportation, or discovery purposes have been idle for years, with owners dead or unknown, or unable to continue work or even keep up repairs. For such property it is often impossible to obtain clear title, or to compel the record owner or his assigns to resume work or to sell at a reasonable price. In the matter of mill sites the law should be changed so that only surface rights could be obtainable under that form of claim.

The author is not in favor of the abolition of the apex and extralateral rights doctrine for reasons given in Chapter XIV, but can see good cause for modifying it so that the right would attach only to the vein or deposit first discovered, and upon which the location was made, the pursuit of all other veins subsequently found to be limited by vertical boundary lines. This would be no hardship on the original discoverer, and would simplify matters greatly for adjoining owners. Discovery by borehole should be distinctly legalized.

The rules for the staking of claims could be much improved without legislation, and without adding unduly to the obligations of the prospector. The method prescribed in the French Guiana law for this act is worthy of consideration, as it not only tends to the installation of monuments of much greater permanency, but makes their removal or migration a matter of greater difficulty. Several of the Canadian provinces have most excellent

rules for this act, which is generally very carelessly performed by the American locator, entailing uncertainty or confusion later on if clearly defined original lines ever become of importance.

In all changes that may be made in the Federal law the prospector and the miner should be given the opportunity to express themselves. There are plenty of men who are now or who have been in the past actual explorers and diggers, with ideas worth listening to, and with the ability to state them. It should not be forgotten that the law as it now stands was framed by just such people, and that for nearly 70 years the industry has been operated under its provisions with magnificent results. It is their right to be consulted, and it will pay to listen attentively to what they may have to say.



CHAPTER XX

Miscellaneous Historical Notes

In Canada mining began in 1857; in British Columbia, which was first entered and explored by the pioneers who poured into California, in 1849 and 1850, and who, from San Francisco and Portland as bases, spread up the coast and into the interior everywhere in search of gold. One of the great alluvial centers discovered during this movement was known as the Caribou district, around the head waters of the Frazer river. In 1863, when at its best, this field yielded nearly $4,000,000 in gold. From that maximum the output steadily declined until in 1893 it amounted to less than $400,000. During the years of depression the prospectors that still remained in the country, reinforced by others from Washington, Idaho, and Montana, swarmed over the region, and a great number of lodes and deposits of silver, lead, and copper ore were discovered, as well as some carrying more or less gold, so that by 1900 the output of the first two metals was amounting in value to nearly $5,000,000 per annum, while that of copper had reached $1,750,000.

During this period of discovery and development mining was conducted under District laws practically identical with those of the United States, but in 1897 they were repealed, and in their place a law was enacted based largely upon the principles adopted in eastern Canada.

In 1887 nickel ore was discovered by railroad graders at Sudbury in the western part of the province of Ontario. In 1897 very rich alluvial gold deposits were found by American prospectors in the valley of the Klondyke river and some of its tributaries. The region was at first thought to be within the limits of Alaska. When that was shown to be an error, prospecting ceased.

In 1905 railroad graders discovered the silver lodes of Cobalt in the northern part of Ontario, and in 1909 the Porcupine gold district was found by hunters. All three became notable in the production of the metals named and still continue so, except the Klondyke, where the cream has been skimmed and the country is now in the hands of dredging companies who are maintaining a handsome though steadily decreasing output. No lode mining of any importance has come into existence in this region.

During the quarter century which witnessed these three important discoveries the regions in which they were made were operating under the provisions of a general Dominion Mining Law which clung—with slight modifications—to the general principles enunciated in the British Columbian law of 1897.

In Australia gold mining began in 1851 in the provinces of New South Wales, Victoria, and South Australia, and by 1858 the industry had spread into Queensland, Tasmania, and New Zealand, and by 1892 into Western Australia. Mining for other metals did not become important until 1882, but by 1891 had exceeded the gold output in value, and has maintained this prominence ever since.

In the early days of the industry in all these British colonies except Western Australia, the only law that existed was in the form of District regulations enacted by the miners themselves, which had to do mainly with alluvial gold deposits, and were—in the main—very similar to those which originated among the miners in California. At first these were of the simplest kind, but auriferous quartz veins were quickly found by the prospectors, who then (in 1858) added to their rules the American doctrine of the apex and extralateral right, applying it to all forms of mineral deposits occurring in rock in place. As in America, the practice produced much litigation, and instead of holding to the principle the Australians decided in 1866 to abandon it.

In considering the beginnings of mining law in these colonies it is to be remembered that, unlike the conditions that prevailed

in western America at the time of the California gold discoveries, where the country was entirely unoccupied except by Indians in the interior and Mexicans along the Coast, Australian settlement by whites began in 1788 with the establishment of a penal colony at Botany Bay, in what is now the province of New South Wales, and that during the years between that date and 1858 very considerable areas had been granted to individuals and corporations for agriculture, grazing, and coal mining purposes. As parts of these areas proved, in the years between 1851 and 1858 to include not only very rich alluvial gold deposits, but regions highly seamed with gold-bearing quartz veins, the doctrine of the apex had to contend with many conditions not found in California and other parts of our West. For while in some of their grants the government had definitely reserved in the deeds the undiscovered but suspected minerals underneath, and in others had as definitely granted them, in perhaps the majority of cases the subject was not referred to at all, or else in so ambiguous and indefinite a way as to require adjudication in the courts. Hence the doctrine added a new difficulty to a problem already sufficiently complicated, and when it was abandoned in 1866 the reason was, confessedly, more to relieve the industry from a possible heavy load of future litigation, than to eliminate any other bad effect already produced. In fact, while it was in force, this doctrine caused, as was the case in America and western Canada, an era of intense and vigorous discovery, and when it was abandoned this era came to an end (as has been the case in British Columbia), although in Australia the prospectors continued active for a number of years in those parts of the continent where little or none of the land had been alienated for agricultural or grazing purposes, and brought in several new districts of importance, the most notable of which was that of Kalgoorlie in Western Australia.

The settlement of New Zealand began in 1840. The first discovery of gold took place in 1852 near Coromandel, but was of small importance. In 1857 the metal was found in payable quantities at Nelson, and in 1858 a specific gold field act was

promulgated, which was largely modelled on the miners' rules then current in Australia, and included the apex doctrine. The output from this district was also small and did not attract the attention of the outside world until 1861, when the Otago fields were found. This was followed in 1863 by the discoveries at Marlboro, and in 1865 by the opening of the West Coast diggings. About this time attention was drawn toward quartz mining, and as the alluvial deposits one by one gave signs of exhaustion and passed into dredging propositions, the need of a code of laws to cover the necessities of underground operations was felt. Hence, in 1877 a general mining law was enacted in which the apex doctrine was abandoned, and the general principles in effect by that time in Australia were adopted. In 1866 a special law was passed covering the mining of coal and Kauri gum. From time to time since then alterations and amendments have been enacted at almost every session of the colonial parliament.

Tasmanian settlement by whites began in 1803 by the arrival of 400 English convicts at the mouth of the Derwent river at the southern end of the island and the foundation of Hobartstown, which became the capital of the colony. In the following year another company of convicts was landed on the northern coast, resulting in the establishment of the city of Launceston at the head of the estuary of the Tamar river. By 1852 when gold was first discovered, the population of the island had increased to 50,000 and considerable areas of public land had been alienated. Prior to 1837 no grants contained any reservation of minerals, but in that year the authorities began the reservation of gold and silver. When gold production commenced the Governor issued a proclamation declaring that all kinds of gold deposits, whether alluvial or quartz, and whether on the public domain or on alienated land, were the property of the government, and if mined without license would result in criminal prosecution. In 1859 the first goldfield act was promulgated, and in 1862 the law was amended so as to include all minerals. In this law, and in those that have since been enacted referring to the mining industry, the fundamental principles of the existing Australian

system were adopted, and since then no mining rights other than leaseholds have existed, while practically all freehold titles that had previously been acquired have, by forfeiture or condemnation, returned to the government. So complete has been this process that Tasmania, of all the dependencies of the British Empire, is today the most perfect example of the results producible by the system on the mining industry.

Under this law and regime development lagged in the colony except in those places where alluvial gold had already been found, and as these proved of small area and but moderately productive as compared with the Australian and American fields the pioneer explorers rapidly drifted away. However, a revival of activity took place in 1871 with the accidental discovery of the Mt. Bischoff tin deposits, and again in 1882 and 1886, when the silver-lead mines of Zeehan and the copper mines of Mt. Lyell were discovered. None of these have been followed by other finds of importance in the same vicinity or elsewhere, and on the whole the industry has declined markedly in importance during late years.

CHAPTER XXI

Conclusion

It is impossible to study the mining laws of the nations without coming to the conclusion that many of them have been framed by individuals better acquainted with the business of legislation than with that of finding and developing mines. This is particularly true of nearly all the British laws, and is very much less the case among those of the Latin-American class. The most notable instance of the contrasting results produced by the two methods of construction is perhaps that of the American Federal mining law as compared with that of the British South African dependency of Rhodesia. The former was framed by the miner and explorer, without the aid of either the lawyer or the mining engineer; the latter by the lawyer and engineer without any signs of assistance from the practical miner.

As discovery and preliminary exploration must precede permanent development and operation, the method that seems to have been generally followed should have been reversed. But laws referring to specialized industries have usually been drawn by legislators rather than by operators, and have been brought into workable condition thereafter only by long processes of amendment. It has been the good fortune of America that its law was drafted by miners, and the results that have been attained under it would seem to indicate that, in the main, their work was commendable. This is not to say that it is perfect and cannot be improved, or that many of the others produced under opposite conditions are all wrong in principle. Had there been a lawyer or two among the California pioneers to put the ideas of the latter into clearer phraseology, or an engineer or two to explain what was known in those days of the forms of

ore occurrences, it is quite possible that much subsequent grief might have been avoided.

In the digests presented in this volume very marked contrasts will be found in methods aiming to bring about identical ends. The farther back one looks into the history of mining the simpler the rules, regulations, and customs are found to be. This, of course, points to times when the unoccupied public domain of each community was large, the mining class small, the demand for the precious metals for coinage purposes insistent, and that for the base metals limited mainly to what was required for weapons. That was the real golden age of the miner; and the frequently frantic call on his fraternity for more gold and silver by the Lords of the Middle ages, and for more iron by the fighting class of the same period indicate the extent to which, even in those primitive days, the world was dependent on him for the tools and appliances of progress.

To-day mining is one of the great activities of civilization ranking next to agriculture among those having to do with the output of raw material. If we consider only the production of metals it might perhaps be advanced to the first place as a source of new wealth. For while the foodstuffs raised by the farmer this year are practically all eaten up by the time the next harvest has matured, all the coal, oil, and tobacco burned up, and all the cotton, wool, and silk well on the way to being worn out, it is not so with the metals. Zinc and lead in the form of paint (their largest use) have a life of at least five years, while in other forms their term of endurance must certainly be rated at double that figure. Iron, when converted into tools, machinery, structural shapes, etc., not only has a still longer life, but becomes capable of earning money in the form of interest and rental for its possessor. Copper and tin persist through a yet lengthier term of active existence before they disappear. Gold and silver as coin endure until they are lost. Probably some of the yellow metal that was employed in gilding Solomon's Temple at Jerusalem, and more or less of that won from the sands of the river Pactolus by the slaves of Croesus, is in circulation to-day. A

million dollars' worth of the ordinary metals may be regarded—from the point of view of accumulating wealth—as the equivalent of from $5,000,000 to $25,000,000 worth of grain or meat, while that amount of the precious metals would then certainly be as valuable as $100,000,000 worth of foodstuffs.

Taking the figures of the year 1913 as a basis, to avoid the unnaturally high prices produced by the war, the value of the world's annual crop of the common metals may be stated in round figures about as follows:

Gold	$460,000,000
Copper	337,000,000
Silver	171,000,000
Zinc	150,000,000
Tin	123,000,000
Lead	109,000,000
Platinum	13,000,000
Nickel	12,000,000
Mercury	6,000,000
Total	$1,381,000,000

This annual crop comes into the market from its various sources of production in about the following amounts:

From the United States	$424,000,000
Europe	240,000,000
South Africa	203,000,000
Latin America	162,000,000
Australasia	119,000,000
Canada	59,000,000
Rest of the world	174,000,000
Total	$1,381,000,000

From this analysis of the subject it is not difficult to understand the value of the metal producing industry to the nations, and the importance of metal mining law as a department of jurisprudence; and if we consider the latter as primarily intended mainly to encourage the discovery of the metallic resources, and secondarily to govern the operations of mining, the subject

will acquire a new interest and value. That this should be its aspect seems to be beyond question.

For, if the demand for the metals seems great at this time, what will it be fifty years hence? They have already become vital necessities. Note the absolute dependence of the machinery business and the railroads on iron, of the electrical industries on copper, of food preservation on tin, and the infinitude of purposes for which paint is a necessity on lead and zinc. How would the manufacturing industries fare to-day without the ferro alloys of manganese, chromium, nickel, vanadium, tungsten and molybdenum, and the chemical industries without the numerous metallic and non-metallic substances that are annually being raised in ever increasing quantities from the crust of the earth? If progress in this line of activity has been wonderful since 1850, what may be expected during the next 70 years, after wars perhaps have come to an end forever?

The legislation that will control the mining of the future is therefore a subject worthy of the most careful attention and study. Other things being equal, that land will be a favored one that possesses a healthy, vigorous, and permanent mining industry. Permanence depends wholly upon the continuance of the agencies of discovery, which are active or dormant according to the freedom of search for hidden underground wealth allowed to the pioneer explorer. As the world depends mainly for its food on the labors of the individual farmer, so it depends for its metals on the efforts of the prospector. The latter, therefore, should be given every kind and variety of freedom in the exercise of his form of activity that is consistent with the maintenance of good order, and be relieved of all burdens that can be shown to be hindrances to his work. I know of no better way of emphasizing the importance of this point than to quote the following paragraphs from the article on Mining in the 11th edition of the Encyclopædia Britannica, Vol. 18, page 541:

"It is to the public interest that deposits of mineral should not be permitted to remain idle and undeveloped. This has been recognized

from the earliest times, and laws have been framed in all countries for the encouragement of mining enterprise.

"In many cases the State or the Ruler has sought to obtain a share in the profits of mining, or even to work mines for the individual profit of the Ruler or of the State. But in most cases it has been found better policy for the State to divest itself of all interest in mining property, and to extend all possible encouragement to those who undertake the development of the mineral wealth of the nation. The mining laws of most civilized states grant the right of free prospecting on the public lands, protect the rights of the discoverer of the mineral deposit during the period of exploration, and provide for the acquisition of mineral property on favorable terms. Striking examples of the far reaching effects of such laws is shown in the history of the Rocky Mountain region and western coast of the United States, the colonization and development of Australia, and the development of Alaska."

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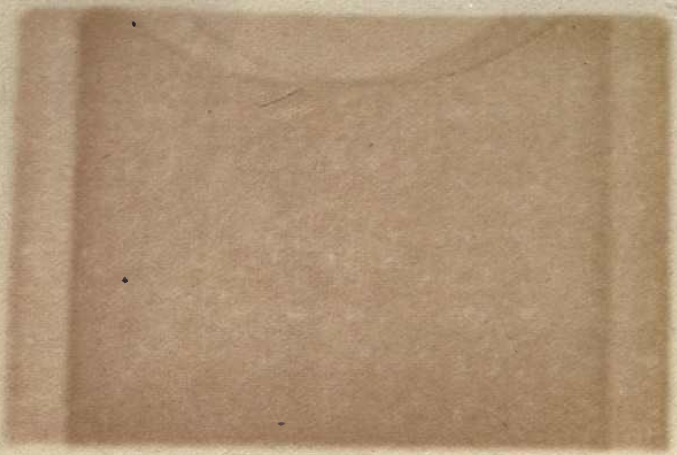
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